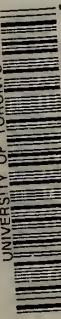


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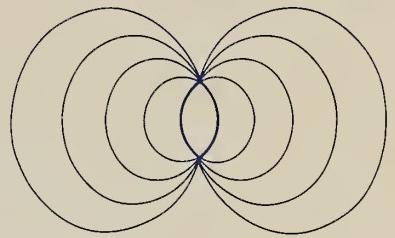


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**ALCOHOL AND
ROAD ACCIDENTS
FUTURE STRATEGIES
AND PRIORITIES**

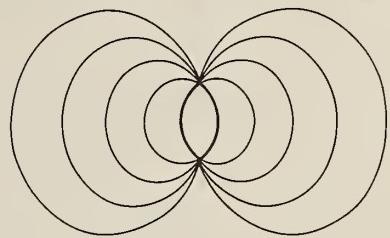




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**ALCOHOL AND
ROAD ACCIDENTS
FUTURE STRATEGIES
AND PRIORITIES**



Proceedings of a Workshop Conducted by the
Traffic Injury Research Foundation of Canada,
November 29-December 2, 1981, Lake Louise,
Alberta, under the sponsorship of the
Alberta Alcoholism and Drug Abuse
Commission.

May 1983

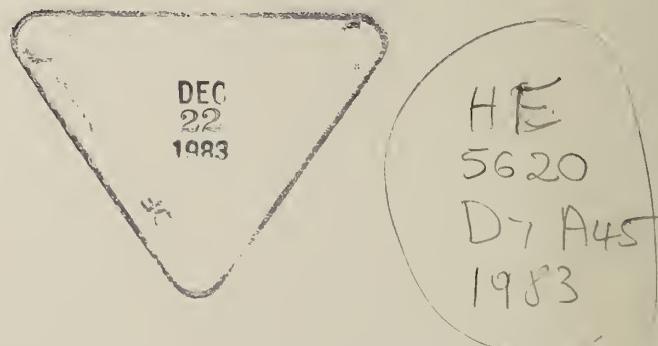
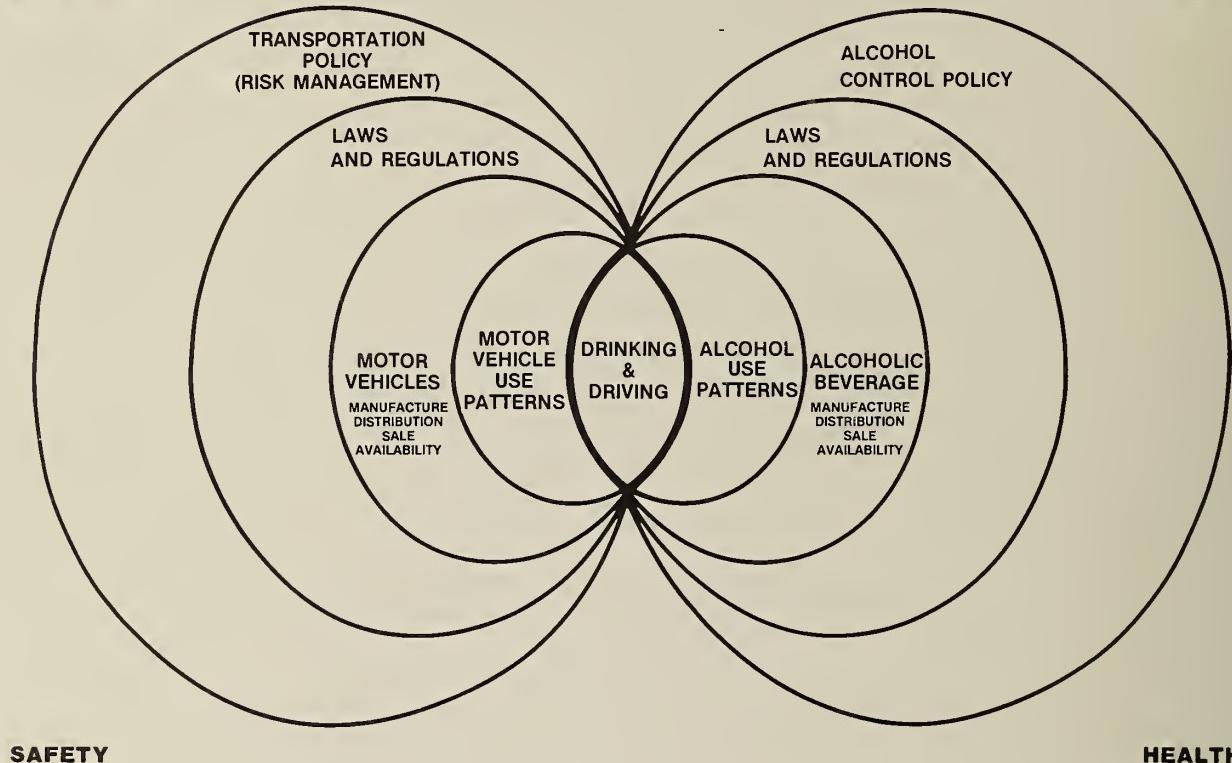
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ALCOHOL AND MOTOR VEHICLES: BEYOND DRINKING AND DRIVING

ECONOMY

JUSTICE



OUTLINE

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Appendix A:

Issues Identified during the Workshop

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ACKNOWLEDGEMENT

As author of this report, I had the privilege of re-listening to the proceedings of the workshop, the recording of which we entrusted to modern technology and magnetic tape. I then had the task of distilling the essence from 20 hours of discourse and debate, which soon became 150 pages of written notes. One participant recalled the proceedings as 'far reaching, free-wheeling, and almost totally undisciplined'. They were. Yet, just as moths flutter erratically about candle flames to reveal a certain coherent purpose (if not progress), so we traced a long and complex verbal path, producing by trail's end an emergent pattern of thought.

Acknowledgement is due, therefore, to the participants of this workshop, who laboured long to bring forth the insight and innovations found in this report. They demonstrated that a "think-tank" often involves more ditch-digging than contemplation in ivory towers (or in mountain resorts). We especially thank those who assisted us in moderating split-group sessions and in digesting (quickly) our collective deliberations: Dennis Attwood, Stephen Benson, and Larry Ross. In addition, all participants received a preliminary draft of this report for review. All who responded said that the proceedings faithfully rendered the substance of the workshop. I appreciated very much their helpful comments. In particular, Stephen Benson, who greatly assisted us in the conduct of the workshop, provided detailed and constructive suggestions.

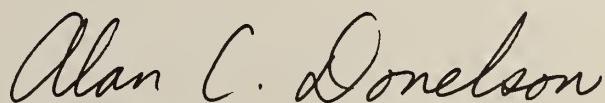
This report sees the light of day because the Alberta Alcoholism and Drug Abuse Commission (AADAC) saw the value of assembling a group of recognized experts to plumb the depths of a difficult, unresolved social problem. AADAC also funded TIRF to prepare this report on their findings. We acknowledge AADAC for this support, coming as it did before the central issue, alcohol and road accidents, once again commanded attention across Canada. In fact, the workshop itself represents a milestone in the development of current thinking about this problem. Participants from Canada and abroad have acknowledged the

value they received from the experience. AADAC has ensured that many others, equally concerned about drinking and driving, can share in this process, which has far to go before we celebrate success.

The Alberta Department of Transportation, Transportation Safety Branch, also contributed to this effort. This agency cooperated with AADAC in covering the costs of travel for an overseas expert and the expenses of post-workshop activities in Calgary and Edmonton. In addition, the Road and Motor Vehicle Traffic Safety Branch, Transport Canada, supported TIRF's preparation of a report on issues in alcohol and traffic safety. That report provided a starting point for discussions during the workshop.

I gratefully acknowledge the contribution of Herb Simpson, Executive Director of TIRF. As Project Director and moderator of the workshop, he forewent sleep and meals to guide this work to fruition. Reg Warren, who has since left TIRF, collaborated with me in preparing the "issues paper". He also brought to bear his talent for provocative thinking and conceptual insights during the workshop. Other TIRF staff also contributed to this report. Robert Lamble and Daniel Mayhew assisted in the conduct of the workshop and recorded each session. Jill Forrest and Wendy Wood produced drafts of this report; they and I acknowledge the assistance of word-processing equipment! Mrs. Claire Ryan supervised the production of this report.

Finally, I would like to acknowledge all those who pioneered work in this area, and all those who cultivate the field. (To name some would do injustice to the many.) We build on foundations of thought and insight nearly a century old. As we construct our own frameworks of thought about alcohol and road accidents, we find that others have gone before us, often many years before. We begin to see that each of us has to go through an ill-defined process to gain a clear appreciation of the scope and magnitude of our undertaking. I hope that this report assists in facilitating that process for you, its reader.



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1.0 INTRODUCTION

This report presents the findings of a workshop on alcohol and road accidents, conducted by the Traffic Injury Research Foundation of Canada (TIRF). The workshop took place from November 29 through December 2, 1981, at the Lake Louise Inn, Lake Louise, Alberta. The Alberta Alcoholism and Drug Abuse Commission (AADAC) sponsored the conduct of the workshop as well as the preparation of this report. The workshop approach was designed to accomplish the following general objectives:

- in light of past research and countermeasure efforts, to examine major issues in the area of alcohol and traffic safety; and
- to identify priorities for future research and action programs.

1.1 Background and Rationale

Early in this century, against a complex background of rapid societal change, the alcohol-crash problem emerged as a distinct — though ill-defined — area of social concern (for example, see the oft-cited **The Quarterly Journal of Inebriety** 1904). By 1940, the gathering of anecdotal evidence had given way to the scientific study of alcohol's role in traffic accidents (Widmark 1932; Heise 1934; Holcomb 1938). Well before research measured its nature and extent, however, preventive measures aimed at reducing the magnitude of the alcohol-crash problem were developed and implemented. The problem was "big" and "something had to be done about it". In fact, experimental and epidemiologic studies served primarily "to dramatize the enormity of the problem and the seriousness of its effects on a complex and fast-moving society" (Borkenstein et al. 1963, p. 144; cf. Gusfield 1981). Perhaps for this reason alone, research on alcohol and traffic safety has rarely displayed the careful, systematic inquiry common to other scientific ventures. As a consequence today, no one can say precisely how great a risk alcohol consumption among road users poses to health and safety, nor how much difference laws, propaganda,

education, and other measures have made (Jones and Joscelyn 1979a,b; Warren and Donelson 1982).

At present, we can roughly estimate the extent and costs of the alcohol-crash problem (Reed 1981). We know much about how alcohol affects human behaviour, though far less about how alcohol impairs performance of the driving task (Carpenter 1963; Levine, Greenbaum, and Notkin 1973; Perrine 1974). We also know that efforts to reduce the alcohol-crash problem by deterring alcohol-impaired persons from driving have made little difference (Ross 1981, 1982). The admonition "If you drink, don't drive; if you drive, don't drink" has been heard, and not heeded, by a substantial portion of the driving population. Information about drinking and driving, although widely held, appears impotent in changing behaviour unless married to intensive police enforcement of impaired-driving laws — which many disregard, some often.

In recent years, those responsible for studying and dealing with the alcohol-crash problem—both researchers and practitioners—have expressed a growing sense of frustration over its magnitude and its seemingly intransigent nature. Despite numerous, diverse approaches to dealing with the problem, few countermeasure programs have been demonstratively effective. Inroads have been difficult at best, and successes have been marginal, costly, and temporary. Periodic conferences, symposia, and workshops have examined the alcohol-crash problem and have issued recommendations for continued research and for the development of countermeasures (e.g., Marks et al. 1981). These recommendations have been implemented in the form of programs with refined focus, but generally as measures already found deficient in terms of the ultimate criteria — a substantial, cost-effective reduction in alcohol-related traffic deaths, injuries, and other losses. This general approach has been described as "keeping the lid on the problem". Such an approach suggests a certain lack of direction and evidences a need to re-examine how best to proceed in the coming decades.

In 1981, TIRF proposed and received funding for two related projects that addressed, in our view, basic issues in the area of alcohol and traffic safety. The Road and Motor Vehicle Traffic Safety Branch of Transport Canada supported the preparation of a report that dealt primarily with issues in alcohol and traffic safety (Warren and Donelson 1982). The Alberta Alcoholism and Drug Abuse Commission (AADAC) sponsored a workshop on alcohol and road accidents that would examine these and other issues and identify directions for future action. Alberta Transportation Safety also supported workshop-related efforts.

Our review of the present state of knowledge and the current state of the art in alcohol countermeasures included recent, comprehensive analyses prepared by internationally respected organizations and experts. Based on these and older (but no less erudite) treatises, we concluded that the time had come to address a general issue confronting public health and safety in the 1980's.

- Are new initiatives possible for reducing alcohol-crash losses, or must past actions to deal with the problem — based on traditional and largely ineffective approaches — be continued, with efforts perhaps redoubled?

This issue, largely a reaction to the "keep-the-lid-on-the-problem" approach described above, provided the rationale for the workshop.

1.2 Workshop Objectives and Approach

The workshop on alcohol and road accidents had the following specific objectives:

- to examine major issues related to the alcohol-crash problem;
- to identify alternative countermeasure strategies that could form a basis for long-range plans and programs;
- to specify critical gaps in present information, which, if filled, could support new initiatives in the area of alcohol and traffic safety; and, in the context of the above,

- to ascertain priorities for the 1980's and beyond.

To achieve these objectives, we invited experts from the international community, both inside and outside governmental agencies, to participate in the workshop. The participants represented many disciplines relevant to alcohol and traffic safety, including psychology, sociology, economics, forensic sciences, pharmacology, and public health. Most were directly involved in research or action programs dealing with the alcohol-crash problem. (Appendix B lists the names and affiliations of the workshop participants).

Pre-workshop activity was undertaken to begin consideration of key issues and to provide background material to participants. As noted above, TIRF staff prepared a comprehensive report that identified major current issues in the field. A preliminary draft of that report, prepared under the separate sponsorship of the Road and Motor Vehicle Traffic Safety Branch, Transport Canada, was provided to each participant prior to the workshop along with an agenda outlining topics for discussion.

The workshop itself had a flexible format. Participants functioned as an interdisciplinary group with a moderator. No formal paper presentations were given. Plenary sessions and separate, small-group discussions were employed as needed to accomplish specific objectives. The workshop design allowed a systematic flow of general topics. A series of group tasks was defined such that output from open discussions provided input to subsequent sessions. The first day was devoted to identifying and discussing major issues. These were categorized, consolidated, and, to some extent, ranked in order of importance. Plenary discussions on the second day focused on major issues with emphasis on alternative approaches to dealing with the alcohol-crash problem. Separate working groups on the last day of the symposium: (1) synthesized the output of preceding discussions; (2) developed recommendations for future plans and programs and (3) identified priorities. A final, plenary session merged the output of the two groups.

A final, preliminary comment seems in order by way of introduction to these proceedings. In this report, and particularly in the next section, the word **issue** appears frequently, perhaps ad nauseam. Because the workshop itself dealt directly with "issues," this seems unavoidable. Constant repetition of a word, however, often results in its losing a sense of meaning. Therefore, two definitions of "issue" from Webster's might prove useful here: (1) a matter that is in dispute between two or more parties; a point of debate or controversy; and (2) the point at which an unsettled matter is ready for a decision. As will become apparent, few issues raised for discussion during the workshop conformed to the second definition.

1.3 Scope of the Report

This report has four sections. The three that follow are briefly described below:

Section 2.0, **Issues**, summarizes key issues

identified during the workshop. Types and categories of issues are defined, and major issues relating to research and countermeasures are discussed.

Section 3.0, **A Strategic Approach**, outlines a long-range, coordinated approach to reduce alcohol-crash losses. The strategic approach integrates action programs, evaluation, and research. Specific examples of short-and long-term initiatives are given for each of the three components.

Section 4.0, **Postscript**, describes recent developments and trends since the conduct of the workshop. In addition, we present a series of recommendations that build on its findings and identify steps toward developing and implementing the strategic approach.

This report contains two appendices. Appendix A lists the many issues and questions raised during the workshop. Appendix B identifies those who participated in the workshop.

2.0 ISSUES

This section summarizes key issues that emerged during the workshop. Identifying and discussing these issues consumed about one-half the total time of the workshop. Even so, by the end of it, this task remained incomplete. The large number and complexity of issues resisted attempts to categorize them — much less resolve them — satisfactorily. If nothing else, however, the sessions proved fruitful in allowing participants to encounter this very difficulty. As a result, the panel better defined the scope, dimensions, and interrelationships of major issues. The discussion of issues also supported subsequent efforts to develop an integrated plan for future activity. Accordingly, the aim of this section is to give the reader some appreciation of these issues, the resolution of which becomes the **raison d'être** of the strategic approach recommended by the panel and outlined in the next section.

As an introduction, the following overview describes the **complexity** of issues current in the field. The intent is not to discourage the interested reader, nor is it to imply that the problem of "alcohol and road accidents" presents a hopeless dilemma. The aim, rather, is to alert the reader to the state of the art, which has more limitations than many realize. The premise underlying the discussion below is that a better understanding of the issues will support the finding of clearer directions and the development of more effective strategies to deal with the problem. In this context, **types** and **categories** of issues are defined as a means of organizing their presentation.

2.1 Issues — And Issues Within Issues

When examined closely, the problems of "drinking and driving" and "road accidents involving alcohol" lose any semblance of simplicity. These problems, long the object of social concern and efforts to reduce them, give rise to a confusing array of issues — questions unanswered and matters unresolved. For many readers of this report, one issue might well be "**Why**, after so many years and so much effort, are there still so many **issues?**" Like those raised below, this

question has no straightforward answer. The persistence of the alcohol-crash problem and the seeming ineffectiveness of countermeasures have led to a growing sense of frustration and a need to re-examine how best to proceed in the future. This re-examination, occurring in many countries, has revealed critical informational gaps as well as problems inherent in dealing effectively with drinking and driving. The number and diversity of issues also relate to the social acceptance and frequency of two activities so integral to society: the use of motor vehicles and the consumption of alcoholic beverages. The frequent overlap of these activities, though simply defined as "driving with a measurable blood alcohol concentration (BAC)", remains amorphous and hard to characterize. Furthermore, past efforts have largely involved programs to reduce the "problem", not to understand it. Some issues reflect this lack of understanding.

The issues also indicate that those active in the field have many different points of view and do not share a single, unifying perspective. All agree to the common aim of ending the alcohol-crash problem; this consensus dissolves when means to achieve the end become subject to debate. To many, this may seem very frustrating, even cause for dismay. If the "experts" cannot agree, to whom can we look for clear direction? The absence of agreement among experts and the apparent failure of agencies to deal effectively with these problems may explain, in part, the conviction and anger that has driven the powerful citizens' movements now sweeping North America. The credibility of experts and the performance of governmental and other agencies have thus become issues as well.

The cyclical ebb and flow of public concern itself raises questions. After all, the alcohol-crash problem and alcohol-impaired driving have continued every year for decades. Does the general public truly support efforts to reduce these problems, or does the common practice of driving after drinking more accurately reflect prevailing beliefs and attitudes? Should Law function as an instrument for social change, or should standards of conduct pertaining to drinking

and driving more closely reflect present norms? Some even consider drinking-driving problems intractable and suggest quite seriously that society could spend its finite resources more wisely by emphasizing general measures to reduce crash losses, for example, increasing restraint use and producing more crash-worthy vehicles. This (perhaps disturbing) conclusion itself becomes a point of controversy and a matter for debate. On one hand, certain groups of people want to "get tough with drunk drivers". On the other hand, some suggest that we ignore drinking drivers and make vehicles and roadways safer for all users, alcohol-impaired or not.

Other factors also contribute to the complexity of issues. How an issue is phrased or expressed can lead to largely semantic discussions. Further, a statement of an issue may presuppose facts or involve assumptions that others call into question. For example, the reliability and validity of data supporting an argument become issues — or, really, **issues within issues**. Disagreement over the appropriateness of certain assumptions can transform a technical point into a philosophic debate.

Ultimately, however, the complexity of issues stems from the **nature** of the problems addressed. The problem of "drinking and driving" has many dimensions, including scientific, economic, legal, social, psychological, moral, emotional, political, and even philosophic aspects. That few issues, if any, can be addressed in complete isolation from all others adds another degree of complication.

The following illustrates this point. One issue discussed by the panel dealt with the extent, or magnitude, of the alcohol-crash problem. Although rough estimates have been made, no one knows how many road accidents are due to alcohol-impaired driving. To some, this is an important issue. For example, information given to the public and to policymakers has tended to overstate the magnitude of the alcohol-crash problem and the extent to which alcohol plays a causal role in the occurrence of road accidents. Such

information feeds mounting public pressure for costly legal and other initiatives and also creates unrealistic expectations of accident loss reductions. More accurate estimates of the actual extent of the problem would support balanced, rational appraisals of future action to deal with the problem. Moreover, even if one accepts the seriousness of the problem, more precise measures of its magnitude over time are needed to evaluate adequately the effectiveness of programs to reduce alcohol-crash losses. Others regard questions about the **magnitude** of the problems as "pseudo-issues". They believe that present estimates, however rough, fully justify efforts, not to research the problem further, but to control it more vigorously. They question whether obtaining better estimates warrants even low priority, given the scarcity of funding for drinking-driving programs. The issue of more precise estimates leads directly to questions of **how** to measure the extent of the problem. Some argue persuasively that such estimates are not feasible, citing limitations of present methods as well as legal, economic and social constraints. Others recommend that methods representing the current state of the art be applied in the study of "alcohol-related" road accidents across the complete spectrum of severity. Even though methods and routinely obtained secondary data fall short of scientific ideals, they would provide data valuable in better approximating the actual magnitude of the problem over time.

In the above example, three types of issues become evident:

- **empirical**, those amenable to study and resolved by observation or experiment (e.g., the magnitude of the problem);
- **methodological**, those involving questions about method, measurement or design (e.g., how to measure more precisely the magnitude of the problem);
- **socio-political**, those related to public policy, especially economic, legal and strategic planning matters (e.g., whether or not more precise estimates are worth the cost of obtaining them).

These types of issues can involve different levels of abstraction, ranging from the general to the specific. Because they tend to interrelate so closely, discussion of an apparently simple question — "How big is the alcohol-crash problem?" — becomes a far-flung debate. Even well-informed people with a broad base of knowledge can suddenly find themselves well out of their area of expertise. Moreover, many socio-political issues, like the setting of programmatic objectives or governmental policy, lay beyond the purview of this workshop to resolve. Yet, resolution of the general, more pervasive issues seems required first before specific, technical issues become meaningful.

The foregoing discussion has emphasized the inherent complexity of the drinking-driving problem in terms of issues. As illustrated, topics that seem discreet and well understood may involve several types of issues. The number and diversity of issues can lead more to debate and disagreement than to their resolution. This realization, however, may prove valuable in itself. By recognizing and accepting that the problem is complex, concerned agencies and individuals may gain a better understanding of the **nature** of the problem and how best to address it in the coming decades. For many workshop participants, at least, the process of identifying and discussing issues was a rewarding, if frustrating, task.

As in most small-group workshops that feature open discussion, the sequence of subjects rarely conformed to a logical, pre-determined outline of topics. To some extent, the panel grouped issues into general categories. Other issues, however, emerged in later sessions. To facilitate their presentation here, the issues are discussed under three headings:

- **The Problem of Alcohol and Road Accidents**, concerning the nature and extent of the alcohol-crash problem;
- **Dealing With the Problem: Countermeasures**, relating to strategies and programs to reduce the magnitude of the problem; and,
- **General Issues**, including those with broader scope or implications for public policy.

The participants identified many more issues than they could discuss at length. (Appendix A of this report lists identified issues.) Sections below summarize those discussed in some detail during the workshop.

2.2 The Problem of Alcohol and Road Accidents

This part of the report considers issues pertaining to the nature and characteristics of the problem as well as to its extent (or magnitude.) These issues relate to **who**, **what**, **where**, **when**, and **why**, and how knowledge and understanding of the problem can support programs to deal with it. As such, the issues include empirical, or research, issues (What do we know? What do we not know?); methodological issues (How can we fill informational gaps?); and policy issues (Why do we want to know, and how much will it cost?).

2.2.1 Defining the problem. What is the problem? As a starting point for discussing alcohol and road accidents, this question may seem trite, and its answer self-evident. Nonetheless, if "doing something" about a problem depends at all on its nature, characteristics and magnitude, then answers to the ingenuous question "What is the problem?" should reveal much about how to proceed in terms of policy and programs. Experts like to call this step **problem definition**. That the question has many different answers also reveals much. **The answers describe points of view — some narrow, some broad — and determine how and where emphasis is placed in dealing with the problem of alcohol and road accidents.**

The phrases "alcohol and road accidents," "drinking and driving" and "drunk driving" tend to conceal the complexity of the problem. These labels define the problem as the overlap of two widespread behaviours: the consumption of alcoholic beverages and the use of motor vehicles. This observation (made above) warrants repeating and deserves careful note. Both "behaviours" include a wide range of personal and social **patterns** of use, some problematic, others not. The

manufacture, distribution and sale of motor vehicles and alcoholic beverages represent billion-dollar enterprises and key strands in the fabric of society. Laws and regulations pertaining to each have a complexity all their own, stemming from social control policies that attempt to reconcile conflicting aims of economy, justice, health and safety. Beyond the use of motor vehicles and alcohol, beyond individual behaviour, the structure of society and current social practice contribute to the alcohol-crash problem and alcohol-impaired driving. Separating drinking from driving, or driving from drinking, admits to no simple solution, even in the abstract.

As we recognize that the problem of alcohol and road accidents is complex, we begin to appreciate why different points of view contend for acceptance. As discovered during the workshop, no one viewpoint appears satisfactory or all-encompassing, nor is any completely right or wrong. All seem to have a place in the overall effort to reduce the magnitude of the problem. At the same time, different (and often unstated) definitions of "the problem" can lead to confusion even when experts discuss issues. Thus, **defining the problem** becomes an issue in its own right.

From the start, workshop participants had difficulty agreeing on a common conceptual framework within which to identify and discuss issues. Some described the problem itself as "poorly conceptualized, misperceived, and misconstrued"; "a nonproblem in the classical sense ... an observed phenomenon and not in itself a causal thing"; "more of a situation than a problem". As Gusfield (1981) discussed, problems such as these are manufactured. At one level, the problem becomes an entity and a source of public concern; at an operational, day-to-day level, offenders are treated routinely, even off-handedly. Drunk driving becomes a "folk crime" with comparatively little stigma attached to those convicted. The alcohol-crash problem also appears diffuse, being (in aggregate) a large number of rare, scattered events. **Because the problem lacks focus and clarity, an integrated social response can seem unrealistic. The**

many current, diverse programs attack the problem in a fragmented, piece-meal way. This is due, in part, to the diversity of ways in which the problem is conceptualized.

For example, a traditional viewpoint regards **alcohol-related motor vehicle accidents** as the primary focus of concern. As one participant remarked, if drivers who drink did not crash, workshops like this one would not occur. As an antecedent to the alcohol-crash problem, **driving after drinking** becomes a logical target for action programs. Programs deal specifically with **alcohol-impaired driving** as a behaviour to modify or discourage by social persuasion or, most commonly, by legal threats. Alternative viewpoints exist and, given the relative lack of success demonstrated by measures focused on "drunk driving," some may now have greater appeal. For example, we can define the problem of alcohol and road accidents in terms of the agents involved. The alcohol-crash problem becomes both a sub-problem of the overall motor vehicle accident problem and only one of many adverse consequences associated with alcohol. "Solutions" to the problem so defined include protecting all vehicle occupants with better restraint systems; making vehicles more crash-worthy and road environments more "forgiving"; promoting moderation in drinking; and rehabilitating those who drink excessively. These approaches address the alcohol-crash problem indirectly but have the advantage of dealing more broadly with motor vehicle accidents and alcohol-related problems. Thus, depending on one's point of view, one might choose to deal with the problem of alcohol and road accidents in any number of ways, directly or indirectly. To a large extent, how one defines the problem determines where, and on what, one places emphasis in terms of resource allocation, plans, and programs.

In summary, the alcohol-crash problem is the end result, or manifestation, of a complex process rooted in the way people use alcohol and motor vehicles and in their attitudes toward drinking-and-driving. This process, however, remains ill-defined and poorly understood. As a result, many issues surround what is known — and not

known — about the nature and magnitude of the problem as a whole. (See Appendix A, Table 1). Participants discussed in most detail the following issues:

- What is the actual magnitude of the problem?
- Why do people drive after drinking?

These and related issues are summarized below.

2.2.2 The magnitude of the problem. As discussed briefly above, available data provides only rough estimates of the extent to which alcohol plays a causal role in motor vehicle accidents. Experimental studies have shown that the effects of alcohol adversely affect skills related to driving. Epidemiologic surveys indicate that many persons with blood alcohol concentrations (BACs) greater than 0.08% w/v (or 80 mg %) are more likely to have road accidents than those who have lower BACs or who have not been drinking. Research, taken as a whole, has demonstrated that the effects of alcohol increase the risk of accident-involvement and that some portion of accidents are due to the effects of alcohol. Beyond these predictable findings, however, lie substantial gaps in knowledge. Limitations in present knowledge stem from the narrow focus of past research; from the lack of systematic, coordinated study; and from the traditional emphasis on programs to deal with the problem rather than research to understand the problem more completely.

For example, literally hundreds of experimental studies have measured the effects of alcohol on **psychomotor skills** believed important to driving. Car handling and control skills, however, comprise only one aspect of driving. Alcohol also affects **attitudes, the ability to perceive hazards, and the willingness to take risks.**

Researchers have long neglected these aspects of driving in studying alcohol's effects. The neglect stems in part from methodological problems. Comprehensive models of the driving task and performance tests that measure the complete array of alcohol effects are lacking. Experimental

research also suffers from inherent constraints on its ability to generate knowledge relevant and valid for real-world situations.

Similarly, epidemiologic research to define the nature and magnitude of the alcohol-crash problem seems deficient. Numerous studies have shown that the risk of accident-involvement increases with greater amounts of alcohol in the body. The ability to detect alcohol, however, has biased perceptions of its role in the occurrence of road accidents. Less tangible evidence of stress, fatigue, driving experience, and other human factors rarely surfaces in the routine investigation of traffic crashes. In fact, in-depth studies indicate that accidents due solely to alcohol are rare indeed. This finding relates to the complexity of road accidents, each of which can involve many factors, and to the inherent difficulty in determining the exact role of alcohol in their occurrence. Typically, the **presence** of alcohol above certain amounts is used to estimate the extent to which alcohol impairment plays a causal role in accidents. The resulting estimates are imprecise and may actually exaggerate the contribution of alcohol to the overall traffic-crash problem. The magnitude of the alcohol-crash problem remains unknown. Moreover, single-factor analyses of "alcohol-involved" road accidents have hindered study of other factors, including personality and behavioural correlates of drinking-driving. As a consequence, **high-risk** drinking-drivers have not been well characterized.

2.2.3 Why people drive after drinking. In addition to questions about alcohol as a causal factor in road accidents and its relation to other factors, participants discussed "drinking and driving" as a behavioural antecedent to the alcohol-crash problem. In particular, the issue of **why** people drive after drinking proved contentious. Unfortunately, the lack of research addressing this issue limited debate to opinions based on differing views about human behaviour and ways to change or modify it.

The experts did not agree on whether or not driving after drinking was preceded by a

"conscious decision process". Some even objected to the term **decision** in relation to drinking-driving behaviour; they argued that few, if any, people consider alternatives to drinking-driving, much less consciously weigh the probable costs and benefits. Others supported the use of theories of decision-making or risky choices in analyzing this behaviour. Such studies might identify possible points of intervention early in the drinking-driving process, before the act of alcohol-impaired driving takes place. This issue — the extent to which people think about driving after drinking — also has import for legal approaches to reduce alcohol-crash losses. The threat of arrest and punishment for alcohol-impaired driving aims at deterring people from driving after drinking.

Presumably, the efficacy of this approach depends on people **deciding** not to drink and drive in the face of such risk. A better understanding of how people assess the risk of arrest, and of how alcohol influences this assessment, could support the development and design of programs to reduce the frequency of drinking and driving.

To answer the question of why people drive after drinking — and why people drive with blood alcohol concentrations (BACs) exceeding the legal limit — will require research to define a "taxonomy of circumstances" that lead to drinking and driving. Studies may identify a variety of reasons or attitudes prevalent among different types of persons, for example:

- people who give no thought or make no conscious decisions about drinking and driving (that is, accept it without thinking as normative behaviour);
- people who agree that alcohol impairs **others'** ability to drive but consider themselves exceptions;
- people who realize they are affected by alcohol but believe they can compensate fully for its adverse effects;
- people who realize they are impaired by alcohol but think the risk of driving in that condition is justifiable even though their ability to compensate is incomplete; and

- people in whom the effects of alcohol are so great as to prevent any rational thought or decision-making about drinking-driving or the risks involved.

One might ask, as was done in the workshop, why do **nonalcohol-impaired** persons drive, and whether that "why" differs from reasons given by those who drive when alcohol-impaired. Some participants speculated that people simply consume alcohol in places requiring private transportation to reach, and that this reflects the basic mores and customs of society. To change these patterns of alcohol and motor vehicle use, they submit, would require social engineering beyond the province of agencies concerned with transportation safety. Although one could characterize the social context and determine how the structure and practices in society contribute to the prevalence of drinking-driving, many experts believed that those conditions and forces would counter efforts to change them. Moreover, they questioned whether people would, or even could, change their drinking-and-driving practices voluntarily. Experts who supported social and behavioural approaches to the drinking-driving problem expressed more optimistic views about influencing drinking-driving practices; at the same time they acknowledged the longer range nature of these approaches. These experts stressed the critical need for research to characterize the drinking-driving process, patterns of drinking-driving behaviour, and the attitudes and beliefs of persons who do (and do not) drive after drinking. If agencies are to develop programs to intervene earlier in the process, issues related to why people drive to drink and drive after drinking must be investigated.

Methodological issues that relate to why people do (or do not) drink and drive involve questions of how to obtain reliable and valid information. For example, a research need ranked high in priority dealt with how people subjectively assess the risk of accident or arrest in the context of drinking and driving. "Subjective risk" might be defined as:
(1) directly measurable (by self-report) or (2) as an intervening variable to explain decreases in the frequency of drinking-driving produced

by "enforcement blitzes". The first operational definition might prove useful if the measure were linked to observable behaviour. One participant thought that the second definition had questionable utility, and recommended the development of direct, functional relationships between certain programs and people's behaviour. In an enforcement blitz, one could measure the number of cars parked near bars, the per capita sales of alcoholic beverages, or the number of people in cars leaving places that serve alcohol. One related question — who responds to drinking-driving campaigns — requires the development of methods with reliable and valid measures of program effectiveness. Some participants considered such measures as self-reported attitudes, beliefs, and practices unreliable because how people actually behave often differs from how they verbally express intentions or assessments. As a consequence, this kind of evidence cannot be accepted at face value. Others acknowledged that self-reported data without objective (or external) validation have inherent weaknesses and other disadvantages. Nevertheless, they considered self-report data a direct and valuable means of "getting inside the heads" of people and learning more about how people think and say they act concerning drinking and driving.

2.2.4 Beyond alcohol and road accidents as simple "cause and effect". In discussing the problem of alcohol and road accidents, participants raised issues concerning the significance of alcohol as a factor in crashes. Some questions dealt with the **nature** of the association between alcohol and road accidents, for example, whether alcohol played a predominantly causal role in the occurrence of accidents or whether the presence and amount of alcohol simply **indicated** the type of people who engage in behaviour more likely to involve them in accidents. What characteristics distinguish **accident-involved** drinking drivers from **other** drinking drivers who do not have accidents? Similarly, what characteristics do **nondrinking** drivers who have different types of accidents have in common with similar

groups of **drinking** drivers? These questions relate to what one participant described as a "compelling, alternative hypothesis": that the overrepresentation of alcohol in road accidents, especially serious accidents, stems largely from people who engage in high-risk driving behaviour and who also happen to use alcohol.

Another participant offered a theory that addressed the following question: What percentage of road accidents would not occur if: (1) the average blood alcohol concentration (BAC) of road users decreased; or (2) the proportion of "drunk drivers" in the driving population decreased? This relates to another hypothetical question: What changes in the magnitude of the drinking-driving problem would take place if we terminated all alcohol countermeasures, including laws related to alcohol-impaired driving? This panel member predicted that, due to the "interchangeability of immediate accident causes", the road accident rate (which may reflect society's tolerance for a certain level of risk) would remain constant. In other words, even if road users consumed no alcohol, no effect on the frequency of accidents would be observed. Thus, there exists no **intrinsic** alcohol-crash problem, but rather a "risk homeostasis" in which other risk factors would replace alcohol, should the latter's influence somehow lessen or disappear. This theory also predicts that, in the unlikely event that society removes programs to reduce the drinking-driving problem, the accident rate would not increase, either. Other participants strongly disagreed with this theory and found no rational basis for those predictions. Nevertheless, to the degree that a "risk homeostasis" operates, it would erode theoretically possible gains of programs designed to reduce accidents by focusing on alcohol consumption by road users. Although its relevancy to the aims of the workshop might be questioned, the theory and its implications certainly were at issue.

2.2.5 The priority and relevance of research. Some participants argued that issues surrounding the nature and magnitude of the drinking-driving (or alcohol-crash) problem lacked relevance, and compared to

questions about how to deal with this problem, ranked low in priority. Even though we cannot accurately measure the extent of the problem nor determine the significance of alcohol as a causal factor in road accidents, no one would deny the existence of the problem itself. Further, "significance" of the problem relates as much to political considerations as to its magnitude. There exists a mandate to take substantial action to reduce the alcohol-crash problem and, until better information becomes available, there exists no basis **not** to proceed very actively. Thus, the actual magnitude of the problem becomes a "nonissue". Why alcohol-using drivers crash — and why people drink and drive — only have relevance if investigations of these issues directly support efforts to prevent drinking and driving or alcohol-related road accidents. At present, the pressing need to launch action programs overrides calls for "more research on interesting but not very useful questions". Other participants believed that issues related to research to define the problem and to increase our understanding seemed critical. Absent resolution of basic issues concerning the nature of the problem, the development of "new" countermeasures "rooted in reality" could not proceed. In fact, such research is one prerequisite for the rational, systematic evolution of approaches to deal more effectively with the problem. The prevention of alcohol-crash losses by "softening up the environment" depends on knowledge of **why** and **where** alcohol-impaired (and other) drivers have accidents. The prevention of alcohol-impaired driving depends on knowing **why** and **in what circumstances** people drink and drive. Those arguing that these research issues ranked very high in priority thought that present informational gaps greatly hindered progress in reducing a serious — and but still ill-defined — social problem.

The general issue of the usefulness and importance of research in the overall effort to deal with the drinking-driving problem leads to another: the relationship between **research** to define the problem and to advance the state of knowledge, and **action programs** to deal with the problem. The latter issue is

discussed after the following section, which concerns topics related to drinking-driving countermeasures.

2.3 Dealing with the Problem: Countermeasures.

Human and economic losses due to alcohol-impaired driving represent one adverse outcome, or consequence, of the combined use of alcoholic beverages and motor vehicles. The alcohol-crash problem thus involves, among others, traffic safety and public health agencies. Therefore, as previously discussed, measures that deal with the problem of road accidents and excessive alcohol consumption have general relevance also for drinking and driving. For example, increased use of restraint systems would mitigate the severity of injury for occupants of accident-involved vehicles whether or not they have consumed alcohol. Programs that successfully treat persons with drinking problems would reduce the frequency of alcohol-impaired driving. This workshop, however, dealt primarily with the social response specific to drinking and driving. Participants recognized, of course, the importance of more general measures focused on road accidents and alcohol use. In fact, whether society should emphasize approaches of the latter kind rather than drinking-driving countermeasures per se became an issue in its own right.

Issues related to efforts to reduce the drinking-driving problem are summarized under the following headings:

- Intervention strategies;
- Deterrence of drinking-driving; and
- Countermeasure effectiveness (and cost-effectiveness).

2.3.1 Intervention strategies.

Efforts to reduce the alcohol-crash problem range from those aimed at separating the use of alcohol and motor vehicles before the act of alcohol-impaired driving takes place to those that lessen the consequences of "alcohol-related" road accidents. The social response to drinking-driving problems includes legal,

health, educational, and technological approaches, as well as programs that combine two or more of these approaches ("systems" approach). The **legal approach**, based on deterring people from drinking and driving using the threat of arrest and punishment, has long served as the cornerstone of strategies addressing the problem. The **health approach** includes treatment and rehabilitation programs for those persons convicted of alcohol-impaired driving and identified as alcoholic or having drinking problems. The "health-legal" approach uses the law enforcement and adjudication process as a "case-finding" mechanism with treatment offered in addition to, or in lieu of, punishment. **Educational approaches** include courses aimed at youth in drivers' education; programs for persons convicted of alcohol-impaired driving; as well as mass informational campaigns through print and electronic media. The last-mentioned approach is often implemented in conjunction with "enforcement blitzes" to enhance public awareness and to increase the perceived risk of arrest. **Technological approaches** have been aimed primarily at facilitating the detection and arrest of alcohol-impaired drivers and the measurement of blood alcohol concentration (e.g., roadside and evidentiary breathtesting equipment). Another example of the technological approach is the attempt to modify the design of roadway environments that seem particularly confusing or hazardous for alcohol-impaired drivers (e.g., larger, more readable signing; better markings of road curvature). **"Systems" approaches** combine those identified above in a more coordinated, systematic fashion, as attempted explicitly by the U.S. Alcohol Safety Action Project. Other approaches include those that attempt to modify behaviour and practices related to drinking-driving through more informal mechanisms, such as interactions among peers ("friends don't let friends drive home drunk").

Despite the wide range of possible countermeasures, the primary social response has involved legal threats and punishment as well as other punitive

measures (e.g., insurance rate increases or loss of coverage, license suspensions or revocation). Many workshop participants questioned heavy reliance on the legal approach, especially in light of evidence that programs based on this approach alone have produced (at best) small, short-lived gains at great cost. **The traditional emphasis on deterrence has diverted attention and needed resources from the development of alternative approaches that complement legal measures.** Alternatives suggested for consideration include community-based initiatives that employ "informal responses" to decrease the social acceptability of driving after drinking; "positive" approaches that offer incentives for not driving after drinking; and increasing the availability of alternative modes of transportation to and from places that serve alcoholic beverages. Agencies and organizations best positioned to foster these initiatives may well be those in the area of health and community services. Their involvement may avoid such public resistance (both active and passive) as engendered by past governmental actions in the area of safety (e.g., seat belt legislation) and law enforcement (e.g., random roadside stops to apprehend drinking drivers).

Some panel members, however, supported continued emphasis on the legal approach as the one having the greatest promise, at least for the near term. The seeming ineffectiveness of this approach, they hypothesized, stemmed from failures to increase sufficiently the risk of detection and apprehension of alcohol-impaired drivers. Past programs have been constrained by their cost; the reluctance of police and the judiciary to implement programs fully; and concerns about infringement of civil rights. Nevertheless, no programs appear to have maximized what could have been done within these limits. They recommend as a "research need" of first-order priority a "social experiment" to raise the risk of apprehension to the politically feasible maximum. An evaluation component would measure its effect (1) on the prevalence of drinking-driving and the number of alcohol-related road

accidents; and (2) on the perception of risk of apprehension among the population at risk.

As participants considered alternative countermeasure approaches specific to drinking and driving, a general issue emerged regarding "intervention strategies". Depending on the outcome of programs that test or increase the efficacy of the legal approach (for example, if deterrent measures fail to reduce the alcohol-crash problem substantially), then perhaps primary emphasis should be placed on measures that address the problems of road accidents and alcohol abuse as a whole. Road accidents involving drinking drivers comprise only about 10-15% of the total number of accidents in a year. As such, the alcohol-crash problem is a "subproblem"; many and multiple other factors contribute to the occurrence of road accidents. Given the relative ineffectiveness of drinking-driver countermeasures to date, measures that ameliorate the consequences of all road accidents and ignore the human factor per se might prove a more efficient, cost-effective strategy. Improvements in vehicle occupant protection and in the roadway environment were mentioned in this regard.

Similarly, the alcohol-crash problem is one of many adverse outcomes associated with the excessive consumption of alcoholic beverages. Rather than attempting to separate drinking from driving by legal threats, programs that reduce the amount and frequency of alcohol use might decrease the number of alcohol-impaired drivers more effectively and at lower cost. Increasing the cost of alcoholic beverages; raising the legal drinking age; and programs to treat and rehabilitate "alcoholics" and "problem drinkers" are examples of alcohol-specific measures.

These general strategies, of course, complement programs that deal directly and specifically with drinking and driving. The central issue is what proportion of finite resources should be allocated to the various approaches, both general and specific, given that current programs implement each approach to some extent. The selection of

strategies and approaches, as well as the allocation of resources, represent high-level policy issues. The resolution of these issues may prove extremely difficult because so many agencies share at least partial responsibility for some aspect of the alcohol-crash problem. Even though each type of measure has the common objective of reducing the magnitude of the problem, programs as presently implemented are fragmented and may never function together effectively without some kind of central, governmental management at Federal, Provincial, and local levels. Organizing and integrating **present** efforts (much less more ambitious, comprehensive approaches) may have less promise in the long run than measures addressing the overall problems of road accident losses and alcohol-use consequences.

In summary, participants identified numerous and diverse approaches to reduce the magnitude of the alcohol-crash problem. It became clear during discussion of intervention strategies that no one approach, in and of itself, constituted the "best" strategy, and that many or all approaches had a place in the overall social response to the problem. At the same time, participants differed greatly on which approach they thought should be given emphasis both in the short and in the long term.

2.3.2 Deterrence of alcohol-impaired driving. A set of issues identified and discussed by participants dealt specifically with deterring people from driving with blood alcohol concentrations (BACs) greater than the legal limit. **Special (or specific) deterrence** refers to the process of apprehending and punishing individual offenders so that they cannot repeat the offense (e.g., incarceration) or so that they will be less likely to repeat the offense even if given the opportunity to do so. **General deterrence** is the restraining effect of laws and the threat of punishment on the population as a whole. Programs that involve specific deterrence (e.g., increased enforcement of alcohol-impaired driving laws) also have a generalized deterrent effect,

especially if combined with public information campaigns. Components of the deterrence approach are: (1) the likelihood (or risk) of apprehension and punishment; (2) the swiftness of conviction and punishment following apprehension; and (3) the severity of penalties for an offense (see Ross 1982).

Participants identified several key issues related to the severity of penalties for alcohol-impaired driving. For example, to what extent does the severity of penalties **decrease** the extent of law enforcement activity? One consequence of conviction (automatic in Canada) is that a person receives a criminal record. Police may enforce the present law less than vigorously, believing that the punishment does not fit the crime, especially if no damage to person or property occurred. Unfortunately, little is known about actual practices of the police in relation to the types and severity of sanctions. Moreover, international experience indicates that increasing the severity of penalties does not, in itself, appear to contribute substantially to deterrence. In fact, lesser penalties (even administrative sanctions such as roadside license suspensions for persons suspected of impaired driving), coupled with increased enforcement to raise the actual and perceived risks of apprehension, might prove as effective, or even more effective, than "tougher laws" and "harsher penalties".

Alternative policies suggested for detailed analyses include: (1) removing statutes concerning alcohol-impaired driving from the Criminal Code and including them in provincial Highway Traffic Acts; (2) raising BAC limits so that persons who are moderate drinkers will not be classed and treated the same as those who drive when grossly intoxicated; and (3) introducing flexibility into laws dealing with alcohol-impaired driving, for example, having a **noncriminal** offense for persons who drive with illegal BACs, but who do no damage to person or property. In this context, some participants recommended that issues related to human rights and civil liberties also be considered as legal initiatives to deal with drinking and driving are developed.

2.3.3. Countermeasure effectiveness — and cost-effectiveness.

Programs implemented to reduce the frequency of alcohol-impaired driving and the number of alcohol-related road accidents have operated, with varying intensity, for many decades. Surprisingly, their effectiveness in achieving these aims remains in doubt. Research that monitors the extent of drinking and driving and the prevalence of alcohol use among accident victims indicates little, if any, progress to date. Informational gaps that preclude precise estimates of the magnitude of the problem also prevent accurate assessment of the impact of countermeasures. The persistent failure to evaluate all types of programs leaves to speculation and bias any judgement concerning their effectiveness. Limited knowledge about the actual magnitude of the problem, and about total costs of programs (including resources dedicated through law enforcement and the judiciary), makes the calculation of cost-effectiveness a matter of "guesstimations". To develop a **strategic** approach to deal with the drinking-driving problem requires careful analysis of alternative plans and programs, especially in economic terms. Lacking even basic data on present costs of the current social response, such analyses become almost impossible and next to worthless. A major issue, therefore, is the feasibility of creating mechanisms to support centralized cost-accounting of various programs. Also needed is the development of standardized criteria to evaluate the effectiveness of different programs as well as their economic, legal, social, and political consequences. These issues point to a third: **To what extent are responsible agencies currently aware of the operation of their programs, their costs, and their benefits?** It may be, as one participant remarked, that if a program is thought to prevent even one death, then that result can represent an acceptable level of accomplishment and justify continuation of the program — whatever its cost!

Part of the problem when discussing **countermeasure effectiveness** is that past expectations of great impacts were not

realized. As a consequence, measures and programs producing lesser (and, in general, **unmeasured**) gains have appeared "largely ineffective". At the same time, "realistic" expectations coupled with some degree of cynicism about the ability of **any** program to make a difference, may encourage the continuation and proliferation of patently inefficient and cost-ineffective programs. The decision to terminate a demonstrably ineffective program and to shift funds to more promising ones does not, however, rest with any given agency or interagency group. Moreover, "territorial imperatives" and viewpoints based on professional (or bureaucratic) survival "short-circuit" such pragmatic ways to increase the overall cost-effectiveness of societal efforts to reduce the magnitude of the alcohol-crash problem. These (very human) constraints and conditions resist change even as the alcohol-crash problem seems to resist efforts to reduce it. A prerequisite to change is the creation of a more effective, centralized management of drinking-driving control measures at the Provincial level. Another prerequisite is comprehensive cost-accounting along with accurate monitoring of the magnitude of the problem over time. **Until data are generated to permit informed decisions by policymakers, and the meaning of these data communicated clearly to those responsible, past practices will likely prevail, namely, programs will continue unabated and not be called to account.**

The issue of countermeasure effectiveness extends beyond the impact of programs on the magnitude of the problem. Very effective programs have been conceived — for example, total prohibition of alcoholic beverages; sensitive detectors of alcohol that, if activated in a vehicle, will immobilize it; and the daily deployment of literally hundreds of police to man random roadside stops. Each of these (perhaps Orwellian) scenarios raises serious objections concerning how far society can go in addressing the drinking-driving problem. **To what extent are we, as members of society, willing to restructure, even dismantle, social institutions in the**

name of health and safety?

One participant posed another broad question:

- Are there **any** effective countermeasures that are technologically feasible, socially and politically acceptable and economically possible?

This question indicates the broad range of considerations engendered by proposed or on-going countermeasure programs. To those one might add "legally implementable". Legal, economic, social, and other constraints operate to reduce the effectiveness of existing countermeasures and to prevent others from being developed or implemented. Although the drinking-driving problem and associated losses may not prove ultimately intractable, even "effective" countermeasures have had only short-lived impacts. The study of countermeasure effectiveness, and their cost-effectiveness, would greatly assist in developing future strategies to reduce the magnitude of the problem.

2.4 General Issues

In addition to issues related to the nature and magnitude of the problem and to drinking and driving countermeasures, workshop participants identified a number of general issues. These are summarized below.

2.4.1 The relationship between research and countermeasures. One of the most troublesome issues encountered during the workshop dealt with the relationship between **research** to define the problem and **countermeasures** to deal with the problem. In practice, research efforts seem little connected to current action programs. Countermeasures are developed and implemented with little regard to the results of research and appear to lack scientific basis. In fact, given the emphasis on programs to reduce the magnitude of the problem, researchers receive almost no funds to conduct studies to advance the state of knowledge and to increase understanding of the problem. As a result, there exists a wide separation (in terms of people and agencies)

between the "research community" and the "programs community". This separation became evident during sessions of the workshop. Some participants most concerned with how best to deal with the drinking-driving problem had little patience with fundamental questions about the nature and magnitude of the problem (research issues). Other participants questioned the feasibility of developing more effective programs in the future in the absence of basic research. Present policy dictates, however, that unless research is directly applied to current programmatic needs, **and can be carried out quickly**, research studies are simply not funded.

Politicians, policymakers, and decisionmakers in government comprise another "community". Public concern over the drinking-driving problem leads to pressure on governments to act. As a result, funds are allocated for action programs, not research. In the absence of such pressure, however, funds are allocated to deal with other problems, and research to fill informational gaps related to drinking and driving still remains undone.

For **researchers**, key issues include how to influence policy regarding the relationship between research and action programs; how to communicate more effectively the need for, and the results of, research studies; and how to integrate on-going programs with research or evaluation efforts. For **practitioners**, key issues include the development of future programs and the identification of critical informational needs that, if satisfied, would support their development. For **policymakers**, the issues seem even more difficult. For example, how should they allocate funds to support action programs as well as research to support the development of more effective measures in the coming decades?

The general issue of an "optimal strategy" for the future development of countermeasures was expressed in terms of three choices: **First**, do as is done now — that is, base countermeasures on educated guesses, but (as is rarely done) use research to evaluate outcomes. **Second**, use research to define

processes underlying the drinking-driving problem to discover countermeasures that can then be tested and evaluated. **Third**, researchers can influence political processes and, indirectly, the implementation of countermeasures. This latter choice, of course implies that the "research community" knows what would work, if only they had their way! None of the three choices gained unanimous support from the panel.

2.4.2 Evaluation of action programs. The panel as a whole agreed readily that **evaluation of action programs is critical**. Participants pointed out that simply "throwing money" at the problem has not proved effective and that, despite decades of law enforcement, education, treatment, and other programs, very little knowledge about how to **improve** the effectiveness of drinking-driving countermeasures has resulted. An evaluation component, they argued, should be included as a mandated part of innovative programs as well as changes in law or deterrent efforts. Evaluation as an integral activity of action programs should be considered early on in the process of developing countermeasures.

These recommendations, which have been advanced at similar conferences over the past 15 years, give rise to other issues. For example, to evaluate a program involves substantial effort and adds significantly to the cost of programs. Practitioners tend to avoid evaluation because, based on past experience, the results of such studies rarely support a program's continuation. Evaluations that have been done were rarely definitive, nor were they constructive. Frequently, resources made available did not support adequate evaluations. Inappropriate methods and techniques were employed by persons unfamiliar with the emerging discipline of program evaluation. Unfortunately, many programs do not have explicit, well-defined objectives. As a consequence, evaluation of these programs in terms of specific effects becomes an exercise in futility.

An inherently political dilemma might be added to this constellation of issues. Agencies responsible for the development of programs

must “sell” their products to fiscally constrained (and therefore reluctant) decisionmakers. The incorporation of expensive evaluation components might well be perceived as a lack of conviction that the program will produce the promised results. Decisionmakers might refuse funding of programs on that basis alone, perhaps having chronic misgivings of the effectiveness of any program dealing with drinking and driving. One way to avoid this dilemma involves the conduct of research that tests the effectiveness of programs on a smaller scale prior to large-scale implementation. (This step in the process of countermeasure development is often confounded with so-called “demonstration projects”, which have as their purpose the “selling” of programs of “proven” effectiveness to the practitioner community.) Objective testing of programs and the objective reporting of evaluation results represent two goals rarely achieved in the past. Nevertheless, despite the bleak picture painted by past experience, **the workshop panel supported, unanimously, the requirement for evaluation as a cornerstone of future activity related to drinking and driving.**

2.4.3 Credibility and communication. As a group of recognized experts, participants asked whether researchers in the area of drinking and driving lacked credibility with the public, policymakers, and practitioners. As one panel member remarked, there exists “an inordinate amount of nonsense and falsehood in material produced in the field, which is difficult to read without a feeling of dissatisfaction. The drinking-driving problem is one that suffers from unrealistic expectations and unrealistic information. Researchers have sold policymakers a bill of goods. A good strategic step might be to resolve to tell everyone the truth — the public and politicians”. The issue of credibility relates as well to public information and education campaigns. People seem to pay lip service to messages carried in the media concerning the seriousness of the alcohol-crash problem and the risks of driving after drinking. In spite of public support for stern measures to deal with the problem, many still drive after

drinking, convinced they are not part of the problem.

The issue of credibility closely aligns with another issue — **communication**. In general, researchers who produce credible work meeting accepted scientific standards do not translate their findings into terms politicians and the public can understand. Technical information, when publicized in the media, becomes distorted by reporters and editors unable to present it accurately and in context. Informational campaigns directed at the public are concocted by “communication specialists” who lack complete understanding of the research-based “facts” they transmit. For researchers, therefore, a pressing question is how the research community can make its findings (for example, evaluations of programs) more influential in decision-making circles. Another question is to what extent credible, factual information about the problem and about recommended courses of action can be delivered to the public. Some participants objected to the notion of “telling the truth” to the public and policymakers, fearing that balanced, factual information might produce counterproductive results. For example, policymakers might decrease funding of existing programs, and people might decide that driving after drinking involves acceptable risks. Other panel members disagreed with this position, believing that new initiatives based in reality must proceed on a frank and clear understanding of the nature and actual magnitude of the problem, as well as an appreciation of the extent the magnitude of the problem can be minimized — and at what costs.

2.4.4 Allocating resources for efforts related to drinking and driving. Participants recognized that comprehensive programs of research and countermeasures cannot be developed in the absence of funds to support these efforts. They also realized that deciding what proportion of finite resources to allocate to this problem is a matter of public policy and could not be resolved in the context of the workshop. Nevertheless, several ways of financing more concerted action and

research were suggested for consideration:

- reallocation of existing funds for highway safety-related programs, targeted especially for research and evaluation;
- reallocation of existing tax revenues from the sale of gasoline and alcoholic beverages; and
- a special added tax on gasoline and alcoholic beverages, targeted directly to drinking-driving programs, research, and evaluation.

Fundamental to the issue of funding activity in the area of drinking and driving are: (1) the cost-effectiveness of existing countermeasures; (2) the development of methods to measure the cost-benefit ratios of alternative strategies to reduce the problem; and, most importantly, (3) the **commitment** to allocate resources commensurate with the magnitude of the problem.

2.4.5. Responsibility for the problem. The current, fragmented approach to dealing with the alcohol-crash problem reflects the diffuseness of responsibility for it. Numerous and diverse agencies and organizations have partial mandates to address specific aspects of this complex problem. Their areas of responsibility, although related in the abstract, appear separate and uncoordinated in practice. Although these agencies share a common concern, officials within them seldom communicate with each other and rarely coordinate their activities. Thus, the following issue becomes paramount if a "major, coordinated, long-term effort" to reduce the magnitude of the problem is to be undertaken:

- **Can the many agencies, organizations, and individuals — which represent specialized interests, different disciplines, and separate areas of responsibility — evolve into the type of network required to develop and implement a complex, long-range, strategic plan?**

"Alcohol and traffic safety" has long

concerned those active in the transportation sector, as the phrase itself suggests. Human losses from road accidents, however, have also long concerned health officials. In recent years, health agencies have played an increasingly active role in the conduct of research and programs. Many other agencies and organizations play roles in the overall effort to deal with drinking and driving. If the fragmented nature of past and on-going activity in the field is to become more integrated, issues concerning effective communication and interaction among these agencies require resolution as well.

2.5 The Outcome of Identifying Issues

As one objective of the workshop, participants identified and examined key issues related to drinking and driving. The assigned tasks of categorizing issues and ranking them in order of priority (not to mention resolving them) proved overly ambitious, given available time. The discussion of many issues, far from producing agreement among the experts, generated "issues within issues" and further contention. Nevertheless, this process did have positive outcomes. The types and interrelationships of issues became more apparent, illustrating, if not defining, the complexity of the drinking-driving problem. These issues, as identified, serve as cautionary flags to interested agencies contemplating programs to deal with the problem. Clearly, the effectiveness of any "new initiatives" will depend on the resolution of many issues summarized above.

These sessions represent only an initial, incomplete attempt to examine issues related to drinking and driving. In-depth analyses along the many intersecting dimensions remain for others to do. Although the deliberations of this workshop might seem superficial, given that the panel of experts resolved few (if any) issues, at least their efforts to identify problems inherent in dealing with "the problem" provide a starting point for subsequent endeavours of this kind.

3.0 A STRATEGIC APPROACH

The process of identifying and discussing issues related to drinking and driving led to discussions aimed at integrating the results of previous sessions. This section summarizes what emerged as a general consensus among the workshop participants. The synthesis presented below does not resolve the many issues outlined in the preceding section. In fact, as noted before, most (if not all) remain for subsequent deliberation by concerned agencies and organizations active in this area. The recommendations produced by the workshop, however, do address questions central to the workshop's purpose, that is, future strategies and priorities. To this end, specific examples of plans and programs complement general statements of the workshop's findings.

3.1 General Statement of Workshop Findings

In deliberating the alcohol-crash problem, the panel of experts reaffirmed what has been stated before:

- that the problem **persists** at an intolerable level, despite long-term outlays of public funds and other resources to deal with it;
- that a **new initiative** must be developed to effect a substantial reduction in the magnitude of the problem.

They recognized that these two assertions form the rationale for identifying strategies and priorities for the 1980's. In the context of these reaffirmations, it was unanimously agreed that meaningful in-roads will be made only as a result of a major, coordinated, long-term effort. This effort, so characterized, constitutes the required "new initiative". As conceived by the group as a whole, it includes traditional approaches to the problem — legal, health, educational, etc. — and also includes other, innovative approaches to the problem. The panel found no single "best" strategy based on specific countermeasure approaches. Rather, a **strategic** approach combining all others, unified by a comprehensive, operational plan, best satisfies the needs identified in this area of public health and safety. Of primary importance, therefore, is a detailed, **and**

implementable, strategic plan. Identifying the need for, and developing an outline of, such a plan represent major outcomes of the symposium.

Strong governmental commitment both to a long-range plan and to accepting leadership in its implementation are essential prerequisites for a successful outcome. In assuming a strong leadership role, governments must ensure that a multi-faceted plan to reduce the alcohol-crash problem can unfold systematically. In the absence of co-ordination, simply increasing the amount of funds for the separate activities of individual agencies offers little promise of effectiveness in the long term. In contrast, supported by an explicit, long-term commitment to deal effectively with the problem, a **combined** and **integrated** program that includes **action, research, and evaluation** components, executed in an iterative fashion, promises much in terms of long-range effectiveness.

3.2 Why a "Strategic" Approach?

In general, sustained decreases in the number of traffic deaths, injuries, and other losses related to alcohol use among road users remain an unachieved goal of public health and safety programs. This fact raised a general issue discussed at length: **Why** have past efforts **not** proved more effective? Unfortunately, as summarized earlier, present knowledge does not provide clear, complete answers. Many factors have contributed to the apparent lack of progress. These factors include socially ingrained patterns of alcohol and motor vehicle use; inadequate resources allocated at federal, provincial, and local levels of government; programs conducted without evaluation to assess effectiveness; and the fragmented nature of past efforts as a whole.

Research has shown that the alcohol-crash problem pervades society in a diffuse, complex way. The panel concluded that an effective societal response must address the nature and scope of the problem in a corresponding fashion. The current, relatively unstructured approach to dealing with this

problem reflects the diffuseness of responsibility for it. As noted before, many governmental agencies and other organizations share concern about the alcohol-crash problem. Each, to different degrees, becomes involved in countermeasure or research programs, or both. These groups, almost all of which have only partial mandates in this area, seldom communicate and rarely coordinate their activity. No single agency or organization exists to focus available resources in a co-ordinated manner. To establish a more structured approach — one that supports the major, coordinated, and long-term response required — demands a strategic plan integrating many disparate elements.

The panel, therefore, developed a general outline for a strategic plan. As conceived by the workshop, the strategic plan represents a **process**, not a panacea. As a process, it can incorporate short- and long-range plans and programs with distinct, though interrelated, objectives. **A strategic plan in and of itself, however, cannot "solve" the alcohol-crash problem. It does prescribe a general approach to deal with the problem.**

The potential effectiveness of this approach depends wholly on those willing and committed to bring about its actual implementation.

3.3 Outline of the Strategic Approach

The panel outlined the strategic approach in terms of three integral components: **action**, **research**, and **evaluation**. The panel stressed that these components should not be considered as separate activities within a common, conceptual framework. Rather, each component represents one aspect of an integrated and coordinated societal response. The plan has one major objective — a substantial reduction in the magnitude of losses due to alcohol-impaired driving. All components of the plan share this objective.

The emphasis on **integration** and **coordination** reflects concern about the effectiveness of past efforts to reduce crash losses associated with alcohol use.

Countermeasure programs, which in this plan comprise the **action component**, effect

planned loss reductions. Their past isolation from **research**, as well as their present freedom from **evaluation**, together may have lessened their potential impact. Clearly, their actual impact on the problem appears less than that desired and expected. The strategic plan as outlined acknowledges explicitly the essential roles of research and evaluation. The relevance of research and the value of evaluation can be greatly enhanced by **functional integration** with countermeasure approaches. In reality, separate agencies at different levels of government and private, independent organizations now participate in all areas covered by the plan. **Coordination** of action, research, and evaluation activity becomes a paramount concern.

The workshop did not address the pragmatic issue of how, in practice, to integrate and co-ordinate these activities. Limitations of time did not allow participants to confront this critical issue. Nevertheless, as an initial step, the panel did discuss each component of the strategic plan and described how each relates to the others. In particular, participants identified specific programs and priorities within each area of activity. The following section deals primarily with the three components of the strategic plan, including specific programs and priorities proposed during the workshop. Not all the specifics received total support from all, or even most, participants.

3.4 Components of the Strategic Approach

Participants discussed the functional components of the strategic approach — action, research, and evaluation — primarily in terms of near-term and long-term countermeasure approaches and programs; research studies to support that activity; and careful evaluation to assess not only the effects of action, but also the validity of assumptions underlying them. These discussions are summarized below.

3.4.1 Action. Plans and programs to reduce the magnitude of the alcohol-crash program

comprise, in aggregate, the **action** component of the general strategy. Participants identified a wide range of specific programs as both practical and promising responses to the alcohol-crash problem. These action plans fall into three general categories: deterrence or legal control, technological and engineering measures, and social-behavioural approaches.

In the area of **deterrence**, the panel generally agreed that the **the full potential of enforcement alternatives has yet to be explored. Participants also generally agreed that more severe sanctions, for example, mandatory jail sentences, would not likely prove very effective.** Considerable basis exists, however, for increased enforcement of existing laws against alcohol-impaired driving. For example, given current levels of enforcement, the likelihood of being detected for impaired driving may be as low as one in 2,000. In this regard, it was recognized that substantially increasing the **actual** likelihood of detection, apprehension, conviction, and sanction of alcohol-impaired drivers has considerable promise. This law-based approach serves two general functions. First, it provides the means to enhance the general and specific deterrence inherent in legal control. Second, it constitutes an affirmation by society of its intent to reduce the magnitude of the alcohol-crash problem and thus provides a solid foundation for such longer term efforts as those described below.

Specific recommendations offered by individuals included the following:

- Continue existing enforcement and conviction practices, perhaps increasing to some extent both their efficiency and their fairness. Add adequate technical means to ensure that people with suspended licenses cannot drive. Programs to reduce the frequency of driving with license suspended will require research, development, and evaluation.
- Introduce a “barracks approach” as an alternative to jail and license revocation. These latter measures increase the likelihood that a family breadwinner will not be able to support dependents, increasing

the need for welfare or other public assistance. This approach could be integrated with re-education programs for drivers as well as treatment for problem drinking.

- **Divert, on a massive scale,** traffic enforcement resources from many current and unproductive pursuits. Implement road-block techniques that can greatly increase the efficiency of detecting and apprehending alcohol-impaired drivers. This program could greatly enhance the general deterrent effect on drivers who know they will have occasion to drink.
- Introduce and enforce legislation that makes it an offense to serve alcoholic beverages to a person who then drives when alcohol-impaired. The objective of this measure is to increase awareness among the population at risk and among third parties who serve alcohol.
- Keep existing laws and sanctions as they are now. Reform their administration, however, so that persons convicted of alcohol-impaired driving pay a greater share of their costs to society.
- Remove statutes pertaining to alcohol-impaired driving from the Criminal Code and place them in provincial Highway Traffic Acts. Inefficiency stemming from police reluctance to enforce Criminal Code provisions may thus be lessened. Remove the choice of severity of penalties from judges by incorporating specific, prescribed sanctions in the Highway Traffic Act.

In the area of **technological development**, the panel recognized that engineering advances in motor vehicle safety and the design and improvement of the roadway environment support efforts to reduce alcohol-crash losses and, of course, traffic crash losses in general. These on-going programs should continue. Effective application of existing technology, in particular, increased use of occupant restraints, was identified as a priority in this area.

Specific recommendations by some participants included the following:

- Mandate the production and purchase of "safety vehicles". This measure is directed toward the end of the causal chain linking alcohol and road accidents, and also addresses other accident factors. Its purpose is to minimize the consequences of all road accidents, accepting as inevitable their occurrence.
- Concentrate resources to improve the safety of vehicles and to reduce hazards in the roadway environment.
- Increase, through various types of programs, the use of occupant restraints. Enforcement of mandatory seat-belt laws can achieve this along with public information and education programs to increase awareness of law enforcement and of their safety benefits.

In the area of **social/behavioural programs**, the panel considered a broad array of initiatives. Concerted, **community-based** programs must be developed to change the present social climate, so that alcohol-impaired driving is more widely viewed as socially unacceptable behaviour. In the longer term, such programs can produce a sustained shift in social norms and thus reduce the prevalence of alcohol-impaired driving. Other social/behavioural initiatives include the development and use of **positive approaches or incentives** as an alternative or a supplement to the punitive approach. In this context, providing and encouraging alternatives to drinking-driving (for example, increasing the availability and promoting the use of modes of transportation other than the personal automobile) were viewed by some as promising areas for development.

Specific recommendations for social/behavioural programs follow:

- Initiate a 5- to 10-year program to create a social norm that makes driving after drinking socially unacceptable. This program constitutes a community-based strategy in 15 steps (see Table 1). These 15 steps comprise a reasonable, practicable approach, which might be applied to other social problems as well. A pilot program would test the hypothesis that meaningful and sustained reductions

in the problem will come about when societal norms and values related to drinking and driving change.

- Generate awareness and acceptability of modes of transportation as alternatives to drinking and driving. This program would address alcohol-impaired driving stemming from non-spontaneous situations involving consumption of alcoholic beverages.
- Develop incentives for drivers to remain accident-free, not focusing in particular on drinking and driving. **A prerequisite is a much more cohesive, dynamic, road-safety, risk-management strategy than presently exists.** As a first step, governments could nationalize ("provincialize") the automobile insurance industry. This measure would: (1) give governments much more incentive to reduce losses stemming from road accidents (e.g., so that premiums for insurance remain acceptable to consumers); and (2) offer governments a great opportunity for experimentation in the area of incentives.

Each of the above action areas will require a strong research component. For example, in the area of legal control, information is needed on the actual levels of enforcement activities required to increase the subjective probability of detection and arrest for impaired driving. The likely effects of increased enforcement on the overall performance of the criminal justice system should also be analyzed. In the social/behavioural area, research on the **technology for social change** will support the development of community-based action programs. In addition, on-going research efforts to maintain and expand data bases for evaluative and analytical purposes should continue.

3.4.2 Evaluation. As the second component of the overall strategy, evaluation serves as a dynamic link between action and research. Its two-fold function is:

- to measure, and to explain, the outcome of programs and to reduce the magnitude of the problem;

TABLE 1 **A COMMUNITY-BASED** **STRATEGY THAT ILLUSTRATES A** **SOCIAL-BEHAVIOURAL APPROACH**

1. Select pilot and comparison (control) communities (1 or 2).
2. Identify people interested in reducing consequences of impaired driving in pilot communities.
3. Form a Steering Committee from those people.
4. Determine what information they would like to have in order to understand and reduce consequences of impaired driving. At the same time, gather objective data about the actual magnitude of the problem (e.g., number of alcohol-related accidents, impaired driver arrests) in the community.
5. Design study or studies that would provide needed information, plus information to support the development of required strategy to shift social norms, for example:
 - a. extent to which population believes drinking and driving should not be combined.
 - b. extent to which people act consistent with these beliefs.
 - c. who these people are — segment people in population.
 - d. perceived seriousness of impaired driving.
 - e. obtain suggestions for reinforcing beliefs consistent with sought-for norm.
 - f. extent to which people would accept certain measures; survey to assess prevailing societal norms; develop information to support programs in community.
6. Carry out studies in pilot, control communities.
7. Feedback results of research to Steering Group and to public at large to inform them, enlist their assistance in interpreting the findings, i.e., do these findings reflect reality as people know it? In addition, elicit additional suggestions about how to reinforce norm that one ought not to drink and drive.
8. Assess suggestions, using steering group. Sift through these, select practical ones. Steering group's responsibility.
9. Implement suggestions that are promising, practical.
10. Study effects of implementation as well as process of implementation in order to look at effects, repeat survey, continue to collect statistics from available sources. Study processes through participant observation or key informant.
11. Feedback results of studies.
12. Consider additional steps, alternatives — legislation as alternative if no change over term of projects. In one pilot community, consider legal approaches such as increased enforcement or tougher penalties.
13. Implement alternatives in light of research findings.
14. Evaluate impact of process again.
15. End first phase — decide whether worthwhile to continue process in pilot communities or to diffuse results to other communities that might wish to undertake similar efforts.

- to provide input to research and developmental efforts.

Evaluation, while most closely associated with action programs, is a form of research, creating a degree of self-awareness for the community at large. The panel emphasized that an evaluation component must be included early in the design of any pilot study, demonstration project, or full scale program and not performed later as an afterthought. An evaluation must be considered an integral, albeit distinct, part of action plans. In addition to assessing the extent to which specific, explicit programmatic objectives are realized, an evaluation should:

- challenge the validity of premises that underlie the study, project, or program;
- measure the broader impact of an action on the community;
- determine whether allocated resources were sufficient to accomplish stated goals and used efficiently toward that end;
- continue long enough to determine whether any initial effect of a program continues.

Above all, the results of evaluations must be used and the knowledge gained applied to the development of more effective approaches and action programs. It does not suffice simply to damn or praise a particular program. To advance knowledge about the problem and how to reduce its magnitude, an evaluation should also support a broad range of **research** priorities:

- problem definition and monitoring;
- studies to enhance program effectiveness;
- studies to identify new program areas.

Information obtained through evaluation must be presented completely and clearly, communicated widely, and **acted upon**. Only in this way can feedback necessary for a better understanding of the problem be generated in terms of **why** a given action succeeded or not.

3.4.3 Research. The third component of the strategy involves research. Participants viewed the primary purpose of future

research as providing the foundation for bold, new initiatives to supplement the shorter term action plans identified above. They recognized that current and past approaches to dealing with the alcohol-crash problem have helped to keep its magnitude at a reasonably consistent, though unacceptable, level.

Striving to reduce further the magnitude of the alcohol-crash problem will require new and multi-faceted approaches. These approaches must flow from, and be based on, a broad and solid program of research. In fact, the panel acknowledged that many gaps in basic information about drinking-driving behaviour are responsible for the limited number and types of immediate solutions that could be identified. Meaningful action is impossible in the absence of adequate knowledge about the dimensions of the problem. Such information gaps must be closed before the identification of a broader range of new initiatives for the future is possible.

General ideas of interest and examples of specific research efforts identified by the panel are outlined below.

- Development of greater knowledge about the precise magnitude and distribution of the alcohol-crash problem:
 - projects to monitor the nature and magnitude of the problem;
 - research to characterize nonrespondent bias in surveys;
 - studies of the prevalence of alcohol use among persons injured in traffic accidents.
- Increased understanding of the human dimensions of the problem, particularly focusing on alcohol-using and alcohol-impaired drivers:
 - community-based projects, in particular, cohort studies;
 - research to identify factors that influence the decision to drive after drinking;
 - studies of how individuals assess the risks of arrest for impaired driving and of accident-involvement.
- Surveys of the knowledge, beliefs and attitudes of various groups (public, police, practitioners, policymakers, etc.) in relation

to the problem and societal responses to it.

- Exploratory and developmental pilot studies of potential new initiatives, based on advances in the state of knowledge.

The largest information gaps exist in the second listed area. Improvement in knowledge along this dimension should be considered as the highest priority in supporting the development of effective, longer term initiatives in the future.

3.5 Summary

Despite limits to present knowledge and despite the marginal effectiveness of past efforts, the panel reached a general consensus that **alcohol-crash losses can be reduced substantially**. Achievement of this aim has proved elusive. "Solutions" often fail to meet such criteria as being economically

possible, technologically feasible, and socially and politically acceptable. In the opinion of participants, however, a long-range, carefully designed strategy, coupled with a serious, long-term commitment to reduce the alcohol-crash problem substantially, offers considerable promise.

In contrast, a short-range strategy — for example, one based solely on the legal approach, however intensively implemented — may offer only small, costly, short-lived gains. As new initiatives lead to the development of potentially effective programs, these programs should be tested on a small scale and rigorously evaluated. Programs shown to be effective can then be considered for widespread implementation. In this manner, large-scale, costly, but relatively ineffective programs can be avoided in the future.

4.0 POSTSCRIPT

Cycles of concern and complacency characterize the decades of organized social response to the alcohol-crash problem (see Douglass 1982). Each wave of concern brings forth technical reports; conference proceedings; public information and education campaigns; legislative changes; and stories in the electronic and print media. Since the conduct of this workshop in late 1981, the problem of alcohol and road accidents has received unparalleled attention in Canada and the United States of America. What distinguishes the present wave of concern from those in the past is the action of citizens' groups formed by persons who have suffered direct loss from motor vehicle accidents caused by alcohol-impaired drivers. They ask, as we did, **Why?** Further, they demand action, **Now!** They advocate strong courses of action, especially legal measures to deal with a problem they have personally experienced. Their anger and conviction have done far more to motivate policymakers than hundreds of experts writing reports and debating fine points of scientific method. The commitment of these grassroots groups, if enduring, will keep this issue alive for years to come.

To what end?

To date, most "new initiatives" in North America have recycled ideas and implemented programs found wanting during the past two decades. The likelihood of long-term reductions in the magnitude of the alcohol-crash problem appears small. Stiffer laws and harsher penalties, coupled with sporadically increased enforcement, still gain acceptance as primary "solutions". This, despite a growing awareness that effective, longer range programs are needed to address a key factor: the **present social climate**, in which many find drinking and driving normal, acceptable behaviour. Reliance solely on punitive measures and neglect of other approaches (e.g., social and behavioural programs at the community level) hardly shows progress.

Undue concern over recent developments, however, does not seem warranted. Evidence mounts that most people active in the field recognize the need for a "long-range, co-

ordinated, comprehensive strategic approach" to the problem of alcohol and road accidents. Certain citizens' groups, governmental task forces and commissions, and individuals have acknowledged this approach not only as ideal but also as essential. Few today seek the "silver bullet", the single, magical "solution". Such root causes as **problem drinking** and **alcoholism** also receive attention in many jurisdictions, though far less than many deem necessary. Some promotional and educational programs for youth have also begun. Thus, the evolutionary process towards reducing the magnitude of the alcohol-crash problem continues, accelerated by the current wave of activity.

So where do we go from here if we seek to develop and implement a "long-range, coordinated, comprehensive strategic approach"?

An independent, non-profit agency, TIRF has as its mission the reduction of human and economic losses due to motor vehicle accidents. As part of our work, we have developed and maintained a long-standing program of research and development in the area of alcohol and road accidents. Based on our experience, and on insights we gained by participating in the workshop, we recommend several courses of action for consideration. These recommendations pertain more to future directions than to specific plans and programs, more to strategy than to tactics. We strongly believe that, **in addition to short-term action programs**, the community at large has to devote close attention to contextual issues — issues that permeate all areas of the field, the resolution of which become prerequisites for longer term, effective action. As we discovered during the workshop, these issues hamper the resolving of less general questions, for example, the design and conduct of research and countermeasure programs. Each of the following recommendations, therefore, addresses the pragmatic concern identified above: How to develop and implement a strategic approach to reduce substantially the magnitude of alcohol-crash losses.

4.1 Continue the Process of Strategic Planning

As applied in military and industrial organizations, "strategic planning" is a formal, stepped process. Its function is to define precisely the mission or **raison d'être** of the enterprise; to specify clearly goals and objectives; and to develop strategies to accomplish them, taking into account external and internal factors, both present and future, that may affect the overall mission and its aims. Thus, strategic planning is a top-level function that develops plans and programs through which aims are accomplished.

The workshop on alcohol and traffic safety did not apply strategic planning as a method to achieve its objectives, which explicitly concerned "strategies and priorities" for future activity in the field. As one important outcome of the workshop, however, participants realized the need for a strategic plan to deal effectively with the alcohol-crash problem. In fact, the workshop initiated the process itself by identifying fundamental issues that strategic planning best addresses.

An initial step in the strategic planning process might involve the formation of a **Strategic Planning Committee**, composed of acknowledged experts from across Canada and representatives of the many disciplines required for this undertaking. Its primary purpose would be to develop a comprehensive strategic plan that could guide sustained initiatives at Federal, Provincial, and local levels. The study group would examine — **in-depth** — major issues identified in this workshop and would periodically publish its findings as reports on the state of the art. Far from exclusive, the Strategic Planning Committee would interface with, and receive input from, concerned industries, governments, voluntary agencies, and the public as part of its task. Such a body as this could serve a broad array of interests, both public and private, as a resource available to support the development of short- and long-term initiatives.

In recommending that the process of strategic planning continue, we acknowledge not only the great importance of this undertaking but

also the considerable commitment required to sustain and complete the process. As brought out in the workshop proceedings, numerous barriers to accomplishing this task exist. We ourselves, as the "alcohol-safety/health community", may prove the greatest of these barriers. Although we ostensibly share common goals and objectives, we have not fully developed a sense of mission, much less a structure or network that could function as would an organization. Nonetheless, we conclude that the process of strategic planning offers an effective means to confront and resolve basic issues that could thwart — indefinitely — the best intentions of all who share the goal of reducing alcohol-crash losses.

Unless we continue this process, the time, energy, and funds expended during the workshop will have counted for naught. If we ignore this opportunity, the workshop will become just one more meeting on alcohol and road accidents that, ultimately, accomplished nothing.

4.2 Increase Communication Among Persons, Agencies, and Organizations Active in the Field

The relationship between alcohol consumption and traffic accidents has traditionally concerned those active in the transportation sector, as the common phrase "alcohol and traffic safety" implies. In recent years, however, public health agencies have played an increasingly active role in the conduct of research and programs. Both health and safety interests draw much support and substantial resources from educational, criminal justice, and health care systems, as well as other governmental agencies such as motor vehicle and driver licensing agencies. The scope and practice of **alcohol and traffic safety**, therefore, are as broad as the alcohol-crash problem is diffuse. This area of social concern, however, has tended to fractionate along lines of discipline, function, and political subdivisions — if indeed an "alcohol-safety/health community" has ever actually existed. The fragmented nature of past and on-going activity in the field

reflects the diffuseness of responsibility for the problem. The dearth of effective communication among the numerous, diverse interest groups seems chronic.

Given the perceived need for a **combined** and **integrated** societal response to the problem, increasing communication among key actors and principal stakeholders in the field becomes essential. Increased communication may lessen the discordant influence of "territorial imperatives" prevalent among researchers, practitioners, and policy makers. By enhancing the degree of mutual understanding, increased communication would facilitate the removal of barriers between governmental and nongovernmental agencies; between those who initiate and carry out programs and those who would evaluate them; between policymakers and the perennial opposition party, researchers; and between the public and private sectors. The increased exchange of information — and, more importantly, **ideas** — might also reduce redundancy in the field, which has sometimes manifested as a "re-invent-the-(square)-wheel" syndrome, particularly in developing countries.

Concrete steps toward forming and opening communication channels might include:

- developing and publishing directories listing active agencies and groups, as well as resources available to support future programs;
- holding periodic conferences and workshops to assemble representatives of interested parties and to maintain an on-going dialogue;
- creating a nationally distributed newsletter to report current events, on-going developments, and innovative programs relevant to alcohol, road accidents, and drinking-driving.

"Increased communication," however, does not mean more "show-and-tell". The resolution of substantive issues will require imaginative, thoughtful discussion. A spirit of cooperation and a willingness to participate in creating the new initiative will greatly support, not only the aim of effective communication,

but also the (perhaps idealistic) goal of reducing alcohol-crash losses.

4.3 Facilitate Inter-Agency Cooperation and Collaboration

In general, activity in the field resembles more a competition than a cooperative venture. Researchers vie for limited funds from agencies that offer grants and contracts. Governmental agencies jealously guard their partial mandates in the area. Many agencies (both inside and outside government) appear to function autonomously, as if to say "we'd rather do it all ourselves". To the degree this characterization of the field is accurate, efforts to facilitate inter-agency cooperation and collaboration should receive high priority.

Our growing appreciation of the nature of the alcohol-crash problem leads us to believe that effective action will require a complex network of multiple agencies, organizations, and individuals functioning at all levels of society. **This is not to say that we need a megalithic agency incorporating all functions that address all aspects of the problem.** Conceiving of such an organization, much less establishing one, seems impossible — if only because we would have to restructure our social system in the name of dealing with the alcohol-crash problem. As an alternative, however, can we not envision **working together** as a general approach to the problem, deepening our commitment to seek out and establish cooperative arrangements, and dedicating our efforts as parts in service to the whole?

TIRF's own efforts in this field provide a limited example of how such a network could evolve. Our program of research on alcohol and traffic safety has received support from federal and provincial agencies, both transportation and health. The Alberta Alcoholism and Drug Abuse Commission, with support from Alberta Transportation Safety, sponsored the workshop, while the Road and Motor Vehicle Traffic Safety Branch of Transport Canada funded our preparation of the background paper for use by the workshop participants. In another project, TIRF collaborates with the Office of the Chief

Coroner of Ontario and the Centre of Forensic Sciences in conducting a study of cannabis and alcohol use among fatal crash victims. Other agencies, including the Ontario Ministry of Transportation and Communication, the Ontario Provincial Police, and regional and local police forces, actively participate in providing reports and records without charge. Due to the cooperation and collaboration of these separate agencies, a project initiated with limited funds from Health and Welfare Canada now has a scope far exceeding that ordinarily possible.

Based on our experience, then, we strongly recommend that efforts to facilitate similar arrangements among agencies — federal-provincial, interprovincial, intraprovincial, provincial-local — continue as the hallmark of activity in the field and not as the exception to the prevailing rule. Clearly, governments as well as communities could establish interdepartmental or inter-agency commissions to lay the groundwork for co-operative programs. A national (or provincial) clearinghouse dedicated to the area of drinking and driving would assist in "networking" and would provide a central base for disseminating information; identifying resources; and linking potential collaborators. These recommendations may appear overly ambitious, if not wishful. Nonetheless, in the absence of structures or organizations that have continuity in the field and some permanence, we find it difficult to imagine how a "long-range, comprehensive, co-ordinated strategic approach" can evolve, much less be implemented.

4.4 Re-examine Premises Concerning the Nature of — and Responsibility for — the Alcohol-Crash Problem

Over the past two years, TIRF has had the privilege of immersing itself in a critical, in-depth review of the state of the art in alcohol and traffic safety, a rare opportunity made possible by our sponsors. We approached this review with a confidence that, in retrospect, seems unwarranted. Graciously permitted to confront issues rather than simply to compile facts, we quickly found ourselves asking questions with no obvious answers. For

example, after large outlays of public funds and resources for decades, **why** have alcohol-related countermeasures **not** made more of a difference? **Who** is the drinking driver? Why do alcohol-impaired drivers not crash more frequently than they do? Even seemingly simple questions — for instance, how big **is** the alcohol-crash problem? — remain unanswered, despite their empirical nature. As we grappled with these and other issues, we grew in our thinking about alcohol and road accidents, assisted in great measure by others in the field who had also begun to question conventional wisdom, some many years before. In particular, we found it necessary to re-examine certain premises underlying our formulations and conceptions of the alcohol-crash problem and its antecedent — alcohol-impaired driving.

For example, we have in the past painted a picture of the drinking driver as the "killer drunk": the excessively impaired, morally reprehensible criminal who, with reckless and wanton disregard for the lives and safety of others, wreaks havoc, mayhem, and carnage on the highways. This image certainly fits at least some among us; nevertheless, this description, similar to those once again frequently found in the media, seems mostly myth. As Gusfield (1981) observed, such simplistic images serve authorities well in rallying support for legal approaches to deal with the alcohol-crash problem. Unfortunately, they also serve to obscure the reality of drinking driving, which, if we study the results of roadside surveys, involves no one identifiable subgroup in the population at risk. Most are otherwise responsible citizens in good standing within their communities. Perhaps, in the wise words of Walt Kelly's Pogo, "we have met the enemy and he is us".

In recognizing that the alcohol-crash problem arises from the complex interplay of two integral, social activities — the use of motor vehicles and the consumption of alcoholic beverages — we also have to re-examine how we have dealt with the problem in the past. Basically, we have treated the problem as discreet and well-defined. "Alcohol causes traffic accidents." "Alcoholics and problem drinkers cause traffic accidents." Such

statements lend themselves to sharp qualification if not outright contradiction. For instance, "alcohol is neither a necessary nor a sufficient precondition for the occurrence of accidents" (Simpson and Warren 1981, p. 189). Persons who consume relatively large volumes of alcoholic beverages may or may not conform to existing definitions of "alcoholic" or "problem drinker". They may also be so-called "social drinkers" who had "a few too many". Moreover, based on the results of a 6½-year study that analyzed the driving records of 1,247 hospitalized alcoholics, Filkins (1971) warned against the "dangerous ... conclusion that all alcoholic drivers are automatically unsafe drivers" (p.6). Similar debates surround the reliability and validity of BAC as a measure of driver impairment and of the magnitude of the alcohol-crash problem (see Warren and Donelson 1982). Researchers such as ourselves who call into question simplifying assumptions, which some may consider sacrosanct, might well be perceived as "ivory-tower" types. Yet, bare facts remain: Many of our countermeasure programs, founded on apparently inaccurate assumptions about the nature of the problem, have produced poor results given their cost. In light of past experience, to engage yet another cycle of large-scale "drunk driving crackdowns" — which may mean hauling in large numbers of moderate, responsible drinking-drivers — seems thoughtless, pointless, and wasteful. In our opinion, we need more people (policymakers, practitioners, and researchers) devoting more time and energy to **thinking** about the problem, its nature, and how we as

a society can best respond to it.

Above all, we think the time has come to reconsider the issue of **responsibility for the alcohol-crash problem**. One view assigns full responsibility to the alcohol-impaired driver or pedestrian **but for** whose behaviour a traffic accident would not have happened. At one level, this view has great validity. Another view might take into account that we live in a society that encourages the consumption of alcohol and almost demands the use of motor vehicles. This society also structures itself to bring the two into combination. From this perspective, the impaired driver can appear as a victim (Warren and Donelson 1982, pp. 191-197). Somewhere between the alcohol-impaired driver as "problem" or "criminal" and the alcohol-impaired driver as "victim" may lie a simple truth complicated by our present way of thinking about the problem.

Our glimpse of this truth suggests that all of us are part of the problem and, therefore, we can all take personal and individual responsibility for it. Our taking of responsibility, as well as committing ourselves to participate in reducing alcohol-crash losses, are preconditions for a major, long-term, co-ordinated effort. To blame others while absolving ourselves cannot hide what appears as stark reality: We as a society of individuals have created the problem. If we do not take responsibility for resolving it, who will? After all, we have learned one lesson offered by the alcohol-traffic safety experience — the alcohol-crash problem will not disappear on its own.

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APPENDIX A

ISSUES IDENTIFIED DURING THE WORKSHOP

Proceedings of a Workshop on Alcohol and Road Accidents: Future Strategies and Priorities

Table A-1

Issues Related to The Nature and Magnitude of the Problem Empirical (Or Research-oriented) Issues

What are the patterns of drinking-driving behaviour and their distribution in society?

Who is the “impaired driver”? What are the characteristics of subgroups in this driving population?

Why do people drive after drinking?

Under what circumstances do people drive after drinking?

How do individuals assess risks associated with drinking-and-driving?

What is the relationship between drinking and risky driving behaviour?

How does alcohol increase the likelihood, or risk, of motor vehicle accidents?

What behavioural effects of alcohol produce road accidents? How?

How does alcohol influence attitudes, the perception of accident risk, and tolerance of risk?

Given that the **proportion** of alcohol-related road accidents has apparently remained about the same, to what may we attribute the historical trend downwards of highway death and injury rates? (Some point to improved highway environment, safer vehicles, and better emergency medical services as key factors, making it “safer for drunks to drive”).

In addition to fatal accidents, what is the extent of other adverse outcomes of drinking-and-driving? (Fatalities, the most studied outcome, may decrease, while injuries, which occur much more frequently, may increase.)

What is the effect of alcohol on injury severity, given involvement in an accident? Does alcohol impairment itself contribute to the degree of injuries sustained in road crashes?

Among persons who drink and drive, which (if any) are more likely to have motor

vehicle accidents?

What is the relationship between the actual (objective) and the perceived (subjective) risks of accident (or arrest), and between these and traffic accidents?

Is there an irreducible portion of road accidents attributable primarily to alcohol? If yes, how large a percentage of accidents are due to alcohol?

To what extent do other factors (for example, other drugs, fatigue, personality) contribute to the magnitude of the alcohol-crash problem?

What is the magnitude of the alcohol-crash problem?

What is the causal relationship between alcohol and road accidents?

What aspects of human behaviour does alcohol impair? How are these related to driving behaviour?

To what degree does the alcohol-crash problem represent a **tolerance** of risk, such that, even if alcohol were not present in drivers, road accidents would occur at much the same rate?

How many fewer accidents would occur if fewer people drove after drinking or drove after drinking less?

What is the process, or natural history, of drinking-and-driving, including adverse outcomes such as arrest, accident, and injury or death? Where in the process are points for possible intervention (preventive measures)?

Methodological Issues

Is it possible to identify persons at high-risk of alcohol-related road accidents (so-called “target groups”)?

What is (are) the best measure(s) of the problem?

Is the problem of alcohol and road accidents best described as **increased risk** due to drinking and driving (for example, as the overrepresentation of drinking-drivers in accidents)?

Are controlled "laboratory" studies most useful, not to indict alcohol the drug, but to identify "impaired" drivers?

Can we develop better models of how alcohol affects driving behaviour?

How precisely can we measure the magnitude of the alcohol-crash problem?

Is blood alcohol concentration (BAC) an adequate measure of the risk of road crashes?

What information is necessary and sufficient to conclude alcohol influenced behaviour and played a causal role in a road accident?

Is it possible to judge with certainty whether alcohol "caused" a motor vehicle accident?

Can experimental research studies, including vehicle-based investigations, provide conclusive evidence that alcohol impairs real-world driving performance (especially at moderate BACs)?

Policy Issues

Are alcohol-related road accidents worth dealing with as a discreet problem?

What portion of finite resources can — or should be — allocated to studying the problem?

Is there a need for cross-national, comparative research?

Does the present state of knowledge suffice for short- and long-term efforts to deal with the problem?

What is — or should be — the relationship between research (efforts to define the problem) and countermeasures (approaches to deal with the problem)?

Is there a need for further research in this area, or are unanswered questions merely "interesting"?

Are more precise estimates of the magnitude of the problem useful and needed?

Is a better understanding of the nature and characteristics of the problem required to deal more effectively with it? Or are increased knowledge and better understanding of how alcohol affects human behaviour and of alcohol's role in the occurrence of road accidents irrelevant or unnecessary?

Has **alcohol** been overemphasized to the exclusion of other risk factors?

Has the extent to which alcohol contributes to road accidents been exaggerated?

Table A-2
Issues Related to
Drinking-Driving Countermeasures
Empirical Issues

What factors enhance, and detract from, the efficacy of deterrence measures?

What is the relationship between the actual risk of arrest for alcohol-impaired driving and people's subjective (or perceived) risk of apprehension?

Can increased enforcement of alcohol-impaired driving laws be increased to the extent that substantial reductions in the problem result? Can this increased enforcement be maintained over time?

To what extent can legal approaches make a long-term difference?

Are there any "new" countermeasure approaches that have yet to be developed and implemented?

Is there a continual need for novelty in dealing with the drinking-driving problem?

What are the aims and objectives of countermeasure programs?

Will anything we do about alcohol per se affect the traffic crash problem substantially?

Can any drinking-driving countermeasure make a long-term difference in the absence of decreased tolerance of risk in the driving population?

What are the greatest obstacles to reducing the drinking-driving problem?

Methodological Issues

How can the efficacy of deterrent measures be improved?

Can programs be developed and implemented to intervene earlier in the drinking-driving process, for example, before the alcohol-impaired driving act takes place?

What are the criteria for effectiveness for a "successful" or "adequate"

countermeasure?

How do we raise the subjective probability of risk?

Is it possible to identify high-risk individuals or target groups for preventive action?

Policy Issues

What are the advantages and disadvantages of raising legal limits for blood alcohol concentration (BAC)?

Is there an optimal strategy for the development of more effective countermeasures?

To what extent are informal responses of the community relevant in dealing with the drinking-driving problem?

Are there technologically feasible, socially and politically acceptable, and economically possible countermeasures?

Can the range of existing countermeasure approaches be broadened to include others, including positive approaches?

Should issues related to human rights and civil liberties be considered in the context of testing for blood alcohol concentration (BAC)?

Is the sum total effect of special plus general deterrence harmful to society and counterproductive to safety? Does the cost of this approach outweigh its benefit?

Regarding the severity of sanctions for alcohol-impaired driving offenses, to what extent are politicians willing to increase the harshness of punishment and to what extent will the general public accept such measures?

How far in the name of health and safety should the state go in dealing with the drinking-driving problem?

Can the social response to the problem, and the diffuse responsibility for the problem, be integrated?

Given the complexity of our socio-political system, can we realistically expect to effect changes in that system that will lead to reductions in the problem? Or, given the relatively fixed nature of the system, should we develop and implement countermeasures that treat existing social structures and practices as absolutes and that focus on

elements of the problem known to be affected by directed action?

Given the ambivalence of society with respect to alcohol-impaired driving, especially in regard to treating this offense as criminal in nature, would taking impaired driving out of the Criminal Code make such laws more enforceable?

Should, or should not, alcohol-impaired driving be a **criminal** offense?

Should alcohol-impaired driving offenses, in the absence of accidents or injury and death to others, be de-criminalized? What are the advantages and disadvantages of removing alcohol-impaired driving offenses from the Criminal Code of Canada?

Should **general** measures to reduce the adverse outcomes of road accidents (e.g., better passive restraints, more forgiving driving environments) be emphasized over programs focused specifically on the drinking-driver?

To what extent should drinking-driving countermeasures be target-group specific?

Given the competition of various countermeasure approaches for limited resources, which among them should be funded to realize the greatest gain?

What proportion of efforts to reduce road-accident losses should be directed at drinking drivers?

Are countermeasures aimed at "target groups" justifiable?

Table A-3 General Issues

Empirical Issues

What is the cost-effectiveness of the present social response to the drinking-driving problem?

What are the estimated cost-benefit ratios of alternative strategies to reduce the alcohol-crash problem?

Will policymakers accept the requirement for evaluation and provide adequate funds for that purpose?

To what extent would agencies that implement action programs accept the need for, and the conduct of, thorough evaluations of their efforts?

How do various stake-holder groups (e.g., public, judiciary, police) view drinking-driving offenses in comparison to other traffic offenses and other crimes? How do these various groups view the drinking-driving issue as a whole?

Do "alcohol-safety experts" lack credibility? With whom?

Methodological Issues

How can communication among relevant agencies and organizations at all levels of government (and outside of government) be enhanced?

How can on-going and planned action programs be integrated with research and evaluation efforts?

How can the "research community" make its findings more prominent in the decisionmaking process that establishes policy, e.g., level of funding?

How can researchers communicate more effectively the need for, and the results of, research studies?

How can the overall social response to the drinking-driving problem be evaluated in terms of effectiveness—and cost-effectiveness?

Policy Issues

Should the diffuseness of responsibility for the drinking-driving problem be consolidated? How?

How should a "major, long-term, coordinated effort" to reduce the alcohol-crash problem be adequately funded?

What proportion of funds should be allocated to action programs, research, and evaluation in the area of drinking and driving?

What is a more optimal strategy for countermeasure development, especially in regard to the relationship between research and action programs?

Should an "adequate" evaluation component be mandated for inclusion in action programs?

APPENDIX B

LIST OF WORKSHOP PARTICIPANTS

The following persons participated in the workshop. Their titles, positions, and affiliations are those at the time the workshop took place.

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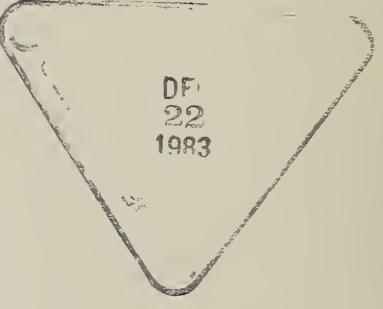
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APPENDIX A

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What is the magnitude of the alcohol-crash problem?

What is the causal relationship between alcohol and road accidents?

What aspects of human behaviour does alcohol impair? How are these related to driving behaviour?

To what degree does the alcohol-crash problem represent a **tolerance** of risk, such that, even if alcohol were not present in drivers, road accidents would occur at much the same rate?

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What is the process, or natural history, of drinking-and-driving, including adverse outcomes such as arrest, accident, and injury or death? Where in the process are points for possible intervention (preventive measures)?

Methodological Issues

Is it possible to identify persons at high-risk of alcohol-related road accidents (so-called “target groups”)?

What is (are) the best measure(s) of the problem?

Is the problem of alcohol and road accidents best described as **increased risk** due to drinking and driving (for example, as the overrepresentation of drinking-drivers in accidents)?

Are controlled "laboratory" studies most useful, not to indict alcohol the drug, but to identify "impaired" drivers?	Has alcohol been overemphasized to the exclusion of other risk factors?
Can we develop better models of how alcohol affects driving behaviour?	Has the extent to which alcohol contributes to road accidents been exaggerated?
How precisely can we measure the magnitude of the alcohol-crash problem?	
Is blood alcohol concentration (BAC) an adequate measure of the risk of road crashes?	
What information is necessary and sufficient to conclude alcohol influenced behaviour and played a causal role in a road accident?	What factors enhance, and detract from, the efficacy of deterrence measures?
Is it possible to judge with certainty whether alcohol "caused" a motor vehicle accident?	What is the relationship between the actual risk of arrest for alcohol-impaired driving and people's subjective (or perceived) risk of apprehension?
Can experimental research studies, including vehicle-based investigations, provide conclusive evidence that alcohol impairs real-world driving performance (especially at moderate BACs)?	Can increased enforcement of alcohol-impaired driving laws be increased to the extent that substantial reductions in the problem result? Can this increased enforcement be maintained over time?
Policy Issues	To what extent can legal approaches make a long-term difference?
Are alcohol-related road accidents worth dealing with as a discreet problem?	Are there any "new" countermeasure approaches that have yet to be developed and implemented?
What portion of finite resources can — or should be — allocated to studying the problem?	Is there a continual need for novelty in dealing with the drinking-driving problem?
Is there a need for cross-national, comparative research?	What are the aims and objectives of countermeasure programs?
Does the present state of knowledge suffice for short- and long-term efforts to deal with the problem?	Will anything we do about alcohol per se affect the traffic crash problem substantially?
What is — or should be — the relationship between research (efforts to define the problem) and countermeasures (approaches to deal with the problem)?	Can any drinking-driving countermeasure make a long-term difference in the absence of decreased tolerance of risk in the driving population?
Is there a need for further research in this area, or are unanswered questions merely "interesting"?	What are the greatest obstacles to reducing the drinking-driving problem?
Are more precise estimates of the magnitude of the problem useful and needed?	
Is a better understanding of the nature and characteristics of the problem required to deal more effectively with it? Or are increased knowledge and better understanding of how alcohol affects human behaviour and of alcohol's role in the occurrence of road accidents irrelevant or unnecessary?	

Table A-2

**Issues Related to
Drinking-Driving Countermeasures**

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What are the greatest obstacles to reducing the drinking-driving problem?

Methodological Issues

How can the efficacy of deterrent measures be improved?

Can programs be developed and implemented to intervene earlier in the drinking-driving process, for example, before the alcohol-impaired driving act takes place?

What are the criteria for effectiveness for a "successful" or "adequate"

countermeasure?	elements of the problem known to be affected by directed action?
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Is it possible to identify high-risk individuals or target groups for preventive action?	Should, or should not, alcohol-impaired driving be a criminal offense?
Policy Issues	Should alcohol-impaired driving offenses, in the absence of accidents or injury and death to others, be de-criminalized? What are the advantages and disadvantages of removing alcohol-impaired driving offenses from the Criminal Code of Canada?
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To what extent are informal responses of the community relevant in dealing with the drinking-driving problem?	Given the competition of various countermeasure approaches for limited resources, which among them should be funded to realize the greatest gain?
Are there technologically feasible, socially and politically acceptable, and economically possible countermeasures?	What proportion of efforts to reduce road-accident losses should be directed at drinking drivers?
Can the range of existing countermeasure approaches be broadened to include others, including positive approaches?	Are countermeasures aimed at "target groups" justifiable?
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Is the sum total effect of special plus general deterrence harmful to society and counterproductive to safety? Does the cost of this approach outweigh its benefit?	
Regarding the severity of sanctions for alcohol-impaired driving offenses, to what extent are politicians willing to increase the harshness of punishment and to what extent will the general public accept such measures?	
How far in the name of health and safety should the state go in dealing with the drinking-driving problem?	
Can the social response to the problem, and the diffuse responsibility for the problem, be integrated?	
Given the complexity of our socio-political system, can we realistically expect to effect changes in that system that will lead to reductions in the problem? Or, given the relatively fixed nature of the system, should we develop and implement countermeasures that treat existing social structures and practices as absolutes and that focus on	

Table A-3 General Issues

Empirical Issues

What is the cost-effectiveness of the present social response to the drinking-driving problem?

What are the estimated cost-benefit ratios of alternative strategies to reduce the alcohol-crash problem?

Will policymakers accept the requirement for evaluation and provide adequate funds for that purpose?

To what extent would agencies that implement action programs accept the need for, and the conduct of, thorough evaluations of their efforts?

How do various stake-holder groups (e.g., public, judiciary, police) view drinking-driving offenses in comparison to other traffic offenses and other crimes? How do these various groups view the drinking-driving issue as a whole?

Do "alcohol-safety experts" lack credibility? With whom?

Methodological Issues

How can communication among relevant agencies and organizations at all levels of government (and outside of government) be enhanced?

How can on-going and planned action programs be integrated with research and evaluation efforts?

How can the "research community" make its findings more prominent in the decisionmaking process that establishes policy, e.g., level of funding?

How can researchers communicate more effectively the need for, and the results of, research studies?

How can the overall social response to the drinking-driving problem be evaluated in terms of effectiveness—and cost-effectiveness?

Policy Issues

Should the diffuseness of responsibility for the drinking-driving problem be consolidated? How?

How should a "major, long-term, coordinated effort" to reduce the alcohol-crash problem be adequately funded?

What proportion of funds should be allocated to action programs, research, and evaluation in the area of drinking and driving?

What is a more optimal strategy for countermeasure development, especially in regard to the relationship between research and action programs?

Should an "adequate" evaluation component be mandated for inclusion in action programs?

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